

THE INFLUENCE OF PSYCHOLOGICAL FACTORS IN THE OUTCOME
OF TREATMENT OF CHRONIC PEPTIC ULCER

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FOREWORD

The main purpose of this study is to investigate the role of psychological factors in the outcome of treatment in a group of patients with chronic peptic ulcer.

The patients were referred to the Gastro-Intestinal Unit, Western General Hospital, Edinburgh. An initial assessment of the group with respect to physical and psychiatric condition and social variables was undertaken. The patients were then followed up at six-monthly intervals for three years, and at each review they were assessed on their physical and psychiatric progress.

The analysis of the results fell into two parts: the first was the investigation of any possible relationship between psychiatric and physical outcome in both surgically and medically treated patients. The second was the investigation of possible predictors of physical outcome in both groups.

Since the method of the study involved interviewing a considerable number of patients, the opportunity has been taken to enquire into a number of other factors, for example, use of alcohol by the group, work record, and smoking habits, which are said to be of relevance to the outcome of treatment in patients with peptic ulcer.

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CHAPTER 1

INTRODUCTION

INTRODUCTION

Chester Jones, Clinical Professor of Medicine, Harvard University, as early as 1945 stated his views on peptic ulcer disease thus:- "anyone who fails to take a fundamental interest in the individual with an ulcer as a psychological and physiological entity fails miserably in visualising the problem and controlling it". This approach to the problem of peptic ulcer, that is, consideration of both psychological and physical aspects will be utilised in this thesis. The role that psychological factors have played in the physical outcome in a group of chronic peptic ulcer patients both after surgical and after medical treatment will be examined.

Review of the literature has shown that this is not a new idea. Since operation was first mooted, and then performed on patients with peptic ulcer to effect relief of their symptoms, surgeons and gastroenterologists have noted that a percentage of patients have to be regarded as failures. The actual proportion of an operated group thus judged varies somewhat with the writer and the criteria which he uses to rate success, but in general, agreement has been reached that approximately ten per cent to twenty per cent of patients will have unsatisfactory results of operation, either in respect that their ulcer recurs, or that new symptoms produced by alteration of gastric function will be as incapacitating as the original peptic ulcer dyspepsia or even more so. When examination of the reasons for failure was undertaken, originally by the gastroenterologists and the surgeons, the tenor of their investigations has moved from consideration of physiological reasons to an increasing emphasis on psychological factors. With these findings, the interest of the psychiatrist has become more apparent and a good proportion of the relevant literature in the last decade has indeed been contributed by psychiatrists. Criticism of the methodology of many of these studies can be made, but possibly a further general criticism

may be introduced here. Gastroenterologists and psychiatrists have diverged in their attempts to analyse failure of operation. A wealth of knowledge is available about the physical aspects of surgery, for example, indications for operation, influence of sex and length of time on the outcome, and the necessity for examining results at intervals over a reasonable period; and on the psychological aspects, for example that anxiety may play a part in outcome, that early history variables may be of importance, that removal of the ulcer may result in new psychiatric symptoms. But practically no attempt has been made to study physical and psychiatric results in a group of patients in the same investigation. In reviewing much of the previous work in this field, the impression gained is that 'opposing' types of investigators, that is, psychiatrists and gastroenterologists, have pursued their research largely unaware of the results of the others.

The present study, therefore, has attempted to examine simultaneously physical and psychiatric outcomes at intervals over a considerable time in a group of chronic peptic ulcer patients in order to observe the influence of the one aspect on the other, and to determine possible relationships between them. It is interesting in this context to note that the original impetus for this study came from a gastroenterologist. His interest lay in the prediction of results of operation, and in particular, whether psychological factors had a predictive bearing on the problem. This study has been designed to examine this question also. But results of one type of treatment, in this case operation, cannot be examined in isolation. It is necessary for the study to be controlled, to see whether any importance which psychological factors may have in outcome is peculiar to the physical fact of operation, or whether they have a role in any treatment situation in peptic ulceration. For this reason a group of medically treated patients, with the same length of history, under the same conditions of referral to

hospital, and of follow-up, has been considered.

As a preliminary step in the investigation it was deemed necessary to delineate the presenting characteristics of the group of peptic ulcer patients whose outcome of treatment was to be examined. A review of the relevant literature has revealed definite well-documented physical findings to be expected in a group of peptic ulcer patients referred to hospital, but both the incidence and nature of any psychiatric symptomatology reported depends largely on whether the author was a psychiatrist or a gastroenterologist, and on the methods whereby the symptoms are diagnosed, for example, whether by clinical judgement or psychological testing. An initial psychiatric assessment, including both clinical diagnosis and formal testing was, therefore, made of the group in whom investigation of treatment outcome was undertaken.

The group of patients was then followed up at six monthly intervals for three years. They separated into two distinct sub-groups a) those who underwent operation and b) those who remained under a medical regime of treatment. At each six monthly interval they were assessed on both psychiatric and physical outcome. Psychiatric symptomatology was compared with that diagnosed at the initial interview, and the patients were assessed as having improved, remained unchanged, or become worse. Similarly the medical patients were given a physical rating after comparison of ulcer symptomatology at that point of the follow-up with the gastroenterologist's findings at the patients' initial interview at the hospital. The physical outcome of surgery was assessed on the presence and severity of residual symptoms after operation.

When the follow-up to the end of two and a half years was completed the results were analysed, first in the treatment groups, and then in the individual patient to ascertain whether any relationship existed between

the physical and the psychiatric outcome. The outcomes of treatment were analysed in detail, that is, at the end of each six monthly interval, and overall, that is, the patient's general progress over two and a half years was considered. A number of psychological factors were then examined in turn to see if any was of value in the prediction of physical outcome. The results of the follow-up at three years were then analysed to see whether any further information had been gained by continuing the follow-up for another six months.

CHAPTER 2

REVIEW AND DISCUSSION OF THE RELEVANT LITERATURE

(The tables relevant to this chapter comprise Appendix II)

REVIEW AND DISCUSSION OF THE RELEVANT LITERATURE

This review and discussion of the literature makes no attempt to cover the whole field of peptic ulcer, but is confined to those aspects which are of relevance to the present study.

It is proposed, therefore, to discuss the literature under the following headings:-

1. Peptic ulcer as a psychosomatic disorder
2. Psychogenic factors in the aetiology of peptic ulcer

Discussion has been confined to theories of causation which purport to add evidence whereby peptic ulcer can be regarded as a psychosomatic disease. Stress is necessarily laid on the inadequacies of our present knowledge. This section has been divided as follows:-

- a) Psychoanalytic concepts.
- b) Role of emotion.
- c) Personality factors.

Findings of the earlier literature discussed under this last heading have been critically examined.

The more recent literature on personality factors in aetiology, that is, work in the last decade, has then been reviewed from two aspects, (i) clinical studies, and (ii) studies with psychological test instruments.

- d) Role of alcohol.
- e) Smoking habits and peptic ulcer.
- f) Parental deprivation.

This section of the review of the literature ends with a summary of the present position in the knowledge of psychogenic aetiological factors.

3. Epidemiology of peptic ulcer

Since this study examines a hospital population of peptic ulcer, only those epidemiological studies which concern that proportion of peptic ulcer patients referred to hospital, have been considered. Limitations in application of the epidemiological method are discussed. Changes in the incidence of peptic ulcer with time have been mentioned, as this finding engenders caution in comparisons between studies separated too widely in this dimension.

The influence of social class and occupational status in peptic ulcer is noted.

4. Relationship between Psychiatric and Physical Symptoms

Other comparable, for example, hospital patient groups have been studied to see if they too show patterns of emotional and personality problems, or if peptic ulcer is alone in this respect.

Two aspects are discussed:-

- a) The incidence of physical illness, particularly peptic ulcer, in psychiatric patients.
- b) The incidence of psychiatric illness in the general hospital.

5. Treatment of peptic ulcer

This section on treatment has been confined to the results of treatment, and divided into two parts.

- a) Results of medical treatment.
- b) Results of surgical treatment.

Under this latter heading the results of treatment have been discussed from two aspects, the physical and the psychiatric.

6. Psychiatric Consequences of other operations

It was considered relevant to the present discussion to study the psychiatric aspects of other operations. In this way findings for the peptic ulcer patients can be viewed against a background of knowledge of other diseases and thus placed in proper perspective.

7. Summary

The present position of knowledge of peptic ulcer which is of relevance to this study is summarised.

Peptic ulcer as a psychosomatic disorder

The demonstration that peptic ulcer, the subject of the present survey, can be regarded as a psychosomatic disease, is the purpose of the first part of this review, which deals with the psychogenic aspects of peptic ulcer aetiology. But it is necessary first to define what is meant by the term "psychosomatic disorder" as it is used in this thesis.

Menninger (1947) suggested that

1. Psychosomatic medicine concerns itself with the psychological approach in general medicine, and
2. certain diseases "constitute bodily disorder whose nature can be appreciated only when emotional disturbances are investigated in addition to physical disturbances".

Galdston (1954) defined psychosomatic medicine very simply as that branch of medicine chiefly concerned with the relationship of emotional tensions to organic and functional disorders. He argued that present-day psychosomatic medicine is historically unique, and is not a direct line derivative of the psyche-soma preoccupations of our medical elders, but that essentially it constitutes a movement to counterbalance and correct some of the erroneous and corrupting ideas and viewpoints propagated in organicist medicine. He argued, therefore, against the concept of specific aetiology and the "time and sequence claim of causality". Kessel and Munro (1964) in their definition of "psychosomatic", though more precise in their terminology, reflected the same ideas. They defined "psychosomatic" to cover "those conditions where

anatomico-pathological and physio-pathological changes are evident, or where symptoms suggest that such changes occur, and in which psychological factors are held to play an important role in their genesis or aggravation". Thus three elements are present in this definition: physical change, the presumption that psychological factors play a part, and a qualitative assessment of the respective importance of these psychological and physical factors.

Chronic peptic ulcer represents an example of irreversible structural disease of the upper gastro-intestinal tract with no agreed pathological explanation. Under the definition it is presumed that the role of psychogenic factors in the disease is important, though it is not claimed that they are causal.

Psychogenic factors in the aetiology of peptic ulcer

Psychoanalytic Concepts

The main theoretical conceptions which have developed over the years have been summarised by Mendelson et al (1953) and by Luminet (1959) as:-

1. The original Freudian theories and the theory of hysterical conversion, (Freud, Ferenczi, Melanie Klein).
2. Personality profile and the theory of conflict specificity, (Dunbar, Alexander).
3. The adaptation and protection reaction (Wolff).
4. Conceptions based on the communications theory (Ruesch).
5. The conception of psychophysiological regression (Kubie, Margolin, Grinker and Szasz).

1. Conversion

One of the earliest psychoanalytic excursions into the field of psychosomatic medicine was the attempt to view psychophysiological disorders as conversion phenomena, in which the symptoms symbolised the repressed feeling. Freud formulated this theory in 1895 in his "Studies of Hysteria", for example, the then revolutionary concept that demonstrable alterations in the functions and structure of cells, tissues and organs could be affected by the psyche. Ferenczi in 1926 described what he considered to be the symbolic role of diarrhoea. Melanie Klein thought of psychosomatic phenomena as pre-genital conversion. Garma, working in Buenos Aires in a series of studies between 1950 and 1958, defended his position that peptic ulcer is the symbolic expression of a bad internalised aggressive mother. He considered peptic ulcer patients are typically in love with someone who does not satisfy them sexually. The ensuing

conflict results in regression to the oral digestive level. Prohibitions against oral satisfaction are substituted for prohibitions against genital satisfaction, and thus the individual's unconscious image of a bad internalised mother acts inside him like a severe punishing conscience, with residual effects on the gastro-intestinal tract, such as higher secretion of HCl and muscular spasm, resulting in the formation of peptic ulcer.

2. Personality Profile and the theory of conflict Specificity.

Dunbar challenged the conversion theory as early as 1935, and attempted to demonstrate, as an alternative way of understanding psychosomatic illness, that certain diseases have a high statistical correlation with certain specific personality types. She outlined personality profiles for sufferers from peptic ulcer, migraine, coronary occlusion and many other illnesses. Further expirical observation has led most workers to question the validity of this conceptual model.

Alexander contradicted Dunbar, and his studies led him to conclude that it is not the personality type that is characteristic of a patient with a given disorder, but a typical conflict situation which can develop in individuals with varying personalities. In peptic ulcer, the patient's repressed longings for help and love are unconsciously equated with the longing for food. This mobilises the innervation of the stomach which then "responds continuously as if food were being taken in, or about to be taken in". It is the continuous secretion which ensues, with its accompanying high acidity,

that is claimed to be an important causative factor in ulcer formation. Quickly, it seemed that this theory passed into the literature as an established fact, and research projects were reported in which the theory was taken for granted, and which had as their objective the unearthing of the specific conflict in a variety of diseases. Gildea (1949) reviewed ulcerative colitis, hypertension, hyperthyroidism, rheumatoid arthritis, peptic ulcer and bronchial asthma. He stated that specific conflicts were present in each of these conditions; in peptic ulcer in particular, the presence of strong dependent needs, and the resulting conflict between passive and aggressive tendencies. He cited only Klein and Obendorf as having opposed the theory.

Yet increasing scepticism about the theory was becoming apparent. This rested on two main objections;

1. the findings of the investigation into specific conflicts; while some of the conflicts uncovered seemed to be unique to a particular disorder, more frequently they were not. A conflict over hostile and/or dependent impulses was reported regularly (Alexander - peptic ulcer, Binger- essential hypertension, Gildea - many conditions, Seward and Morrison - colitis); and
2. inadequacy of their methodology.

In 1952, Bell, Trosman, and Ross published a methodological review of those studies in this field which had used the Rorschach Test. They pointed out the wide variability in selection of cases and controls, and in statistical comparison

between the two groups. They further noted a common error, the failure to ascertain whether the trends found in a group of cases were significantly different from those to be found in individuals not suffering from the disease under study.

With these criticisms in mind Streitfield (1954) tested the hypothesis that individuals with peptic ulcer would differ from individuals with no gastro-intestinal complaints in having a conflict over intense oral-dependent needs, using as instruments the Rorschach Test and the Blacky Pictures. He used ten individuals in each group. Results failed to uphold the theory of specific conflict, at least in the case of peptic ulcer. Rothstein and Cohen (1958) also using the Rorschach Test, failed to demonstrate specific stress factors in their peptic ulcer patients when compared with normal, psychoneurotic, schizophrenic and non-gastro-intestinal groups, and similar results were found by Mednick, Garner and Stone (1959) when they compared peptic ulcer and ulcerative colitis patients.

3. Adaptation and protection reaction

Wolff (1950) formulated the view that the body reacts to stress with what he calls a protective adaptive response. ("Stress" in psychosomatic medicine refers to adverse environmental circumstances which require the intervention of mental activity before bodily changes occur, for example, situations of danger, frustration or risk. It is not the actual circumstances which are important, but the accompanying anxiety, fear or irritation, and the personality's reaction to the situation). Cannon (1929) and Selye (1946)

had investigated the physiological changes of the body in relation to stress, and Selye had formulated the general adaptation syndrome. Wolff's theories were the logical extension of this. He felt that an individual responds somatically to stress and conflicts of many different kinds in a fashion that is consistent for him, and which is determined on a hereditary basis. This theory, however, has not had statistical data in its favour reported.

4. Conceptions based on the communications theory

Ruesch (1948) postulated, in an attempt to answer the question "why do certain individuals develop psychosomatic disease?", that immature individuals, who do not, as a result of early defects to interpersonal relationships, master an adequate system of symbolic communication, use the body for expression of tensions. He concluded, after studying personalities of individuals suffering from post-traumatic syndromes, chronic disease, duodenal ulcer and thyroid conditions, that "the dependent male or female patient represents the personality disorder most frequently seen in clinical medicine".

Deutsch (1939) considered that the choice of organ depended on the accidental association of some particular illness with some significant period of early life.

5. Conception of psychophysiological regression

Alexander had originally used the expression "vegetative retreat" in speaking of a group of patients who, instead of actively facing stressful situations, withdraw into a type of behaviour and bodily functioning more appropriate to the

period of childhood. Margolin (1953) and Grinker (1953) subscribed to this theory of psychosomatic disease, and Szasz (1952) suggested that psychophysiological phenomena can be explained by "regressive innervation" which he defines as "an increased state of excitation of functionally specific para-sympathetic pathways". Because the parasympathetic nervous system develops earlier than the sympathetic, the increased state of excitation of the former is regressive, and represents a retreat in adaptation to stress. He readily explained the aetiology of peptic ulcer under this heading. This concept has largely proved meaningless, because it is very far from being generally accepted that "regressive innervation" does in fact exist.

Roth (1955) reviewed the psychoanalytic contribution to the understanding of the personality of the peptic ulcer patient. He criticised the lack of controlled studies, the paucity of the numbers for which conclusions were drawn, the restricted social group from which the patients came, and noted only a few of them were specifically reported to have completed their analyses (Table 1).

The main psychoanalytic contribution to the study of peptic ulcer has been the formulation of revolutionising principles, and as a source of ideas, which resulted in the awakening of interest in this field.

Role of Emotion in Peptic Ulcer Aetiology

In 1932 Harvey Cushing said "a satisfactory all-embracing explanation of acute and chronic ulceration of the stomach and duodenum is yet to be found". This statement still holds

good today, even though in the intervening years the understanding of the physiological mechanisms that underlie such ulceration has increased. There is now general agreement of the significance of vagal hyperactivity, a view first promoted by Rokitansky (1842), and reemphasized by Cushing (1932), who connected the origin of the vagal impulses to stimulation of the parasympathetic centres in the hypothalamus. In the writings of Selye (1950), Gray (1951), Fletcher (1954), Kirsner, Klotz and Palmer (1952), Myers (1953), Smyth (1951), and Ulin (1954), much has been said about stress, the role of the pituitary-adrenal axis, and the effects of the adrenal-cortical hormones in bringing about gastric hypermotility and hypersecretion, gastric-intestinal ulceration, and at times, perforation.

That emotion and gastric function are related has been long known, and many investigations have shown the importance of emotional stress as a precipitating factor in the development or recrudescence of peptic ulcer. Beginning with Beaumont (1833), clinicians have studied patients with gastric fistulae in order to observe the effects of sundry emotions on peptic physiology. They found profound alterations in gastric function accompanying such feelings as fear, depression, hostility and prolonged tension. Crider and Walker (1948) have demonstrated correlations between gastric physiology and conscious emotional states in a woman with a gastric fistula.

In particular anxiety has been implicated. Davies and Wilson (1937) found that their ulcer patients showed undue tension long antedating their ulcer symptoms. S.C. Robinson (1935) stated that the dominant factor in the ulcer temperament

was worry. C.G. Robinson (1941) considered that functional nervousness, including fatigue and anxiety, was by far the greatest detectable cause of recurrence of ulcer, and probably was responsible for the original ulcer. Cox and Juanila (1946) suggested that an underlying anxiety neurosis was the major factor in the aetiology of duodenal ulcer. Cathcart (1946) found a parallelism between the incidence of peptic ulcer and anxiety neurosis. From the psychic standpoint there was no great difference between peptic ulcer and anxiety neurosis, except that the latter had a more heavily laden background of childhood conflict and neurotic traits, and also increased somatic concern and awareness.

Mittelman, Wolff and Sharp (1942) concluded that reactions of intense anxiety, insecurity, resentment, guilt, and frustration obtained in all their ulcer patients. Compensating efforts to bolster self-esteem by a show of independence, self-sufficiency and perfectionism were common.

Wade (1942), discussing the problem of dyspepsia in the Royal Navy, thought that psychological factors played a much greater role in duodenal ulcer than gastric ulcer, but gave no figures to support this view. Rosenak (1945) considered the problem of digestive diseases in the Army and commented that ten per cent of all admissions to a gastro-intestinal department were for peptic ulcer, and that "frequent discovery of a psychiatric basis for ulcer symptoms" was made, and found emotional problems in

practically all his patients. Flood (1943) showed that symptoms of anxiety neurosis were present in twenty-five out of forty-seven ulcer patients. Worries in some cases related to domestic or financial difficulties, but the majority of his anxious patients were worried about their own state of health, and inability to fit into army life. He emphasized the uselessness of these patients as soldiers.

Opposing opinions exist as well. Gainsborough and Slater (1946) considered that only fifteen per cent of their group of 130 males and thirty-two females admitted to a peptic ulcer unit had psychiatric abnormality. A psychiatric diagnosis was made in nineteen males and six females; chronic anxiety neurosis, mild, five males and three females; fairly severe, two, one; mild recent anxiety neurosis, two, none; mild hysterical reaction two, none; chronic mild obsessional neurosis, one, none; minor mental defect with instability, one, none; psychopaths, hysterical, none, one, and paranoid, one, none; with possible latent homosexuality, one, none; chronic alcoholic, one, none; inadequate, one, none; compulsive adventurer, one, none. They were among the very few investigators to discuss men and women separately, and found that women patients showed a much higher incidence of "constitutional disability" than the men. Montgomery, Schindler, Underdahl, Butt and Walker (1944) found that, of twenty-three patients with duodenal ulcer, seventeen were free from neurotic symptoms, whereas only five were free of them among twenty-two non-ulcer dyspeptics. Edwards and Copeman (1943) sent

101 out of 217 non-ulcer dyspeptics to a psychiatrist on clinical grounds, but only two out of 139 peptic ulcer patients. Halstead and Weinberg (1945) are in agreement with this. Halstead (1946) stated that the personality types of ulcer and non-ulcer patients were totally unlike, of the non-ulcer patients eighty per cent were neurotic, whereas only six per cent of the ulcer patients had neurotic disability. Kirk (1946) is equally sure that the non-ulcer dyspeptic in the army is a neurotic, but that only ten per cent of patients with a proven ulcer were definitely diagnosed as having psychoneurosis.

Similar views were held by Friedman (1948), who claimed that the majority of forty-six peptic ulcers were intelligent successful soldiers. Out of these, eight had somewhat abnormal behavioural patterns, five had mild neurotic traits, and one had a mild anxiety state, but only two were so disturbed as to warrant referral to a psychiatrist. Of his sixty-two functional dyspeptics, fifty-eight had neurotic traits and thirty had psychiatric referral. Montgomery (1944), Payne (1940), Radloff (1947), Ross (1943), and Schildkrout (1944), published papers in the same vein, again discussing peptic ulcers in the armed forces.

Roth (1955) criticised the techniques obtaining in many of these studies; frequently no distinction was made between duodenal and gastric ulcer. As the two kinds of ulcer show differences clinically, a difference in psychogenic factors might be expected. Often no distinction was made between male and female ulcer^{patients}. He examined the relevant literature for the answer to the question "is the ulcer patient usually a

psychoneurotic?". A table of incidence, as given by Roth, is quoted (Table 2). It is clear that there is no agreement, and the same holds among authors who made general statements on the subject but did not give definite figures of incidence. For example, Jones (1946) and Robinson (1937 and 1939) both stated that ulcer patients were not psychoneurotics whereas Cathcart (1946) had stated that ulcer patients frequently showed frank anxiety neurosis. Hamilton (1950) examined duodenal and gastric ulcers separately, compared them with a group of non-ulcer dyspeptics, and a control group of hospital patients. He noted that duodenal ulcer patients definitely showed signs of anxiety neurosis more frequently than did the control group, the gastric ulcers less than the duodenal ulcers, but more than the control groups, and the non-ulcer dyspeptics gave the highest figure of all. The conclusion reached by Roth was that there did seem to be some agreement among those who described psychoneurosis, in that the type found was usually anxiety neurosis.

Brand (1965) found that psychoneurosis had a significant association with intestinal disorders in women but not in men.

Circumstantial evidence of the role of anxiety in peptic ulcer has been provided by observers who attempted to assess this factor in recurrence of symptoms. Einhorn (1930) examined 1000 recurrences in 800 patients and concluded that "psychic load" was important in seven per cent of cases. He quoted anger, grief, shock, emotional and business reverses as possible aetiological factors in this percentage. Crohn (1927) claimed that, clinically, periodic recurrences of ulcer dyspepsia

were most frequently initiated by anxiety. Though he quoted some examples of this he gave no definite figures, and Flood (1948) wrote in a similar vein. Kirsner and Palmer reviewed the peptic ulcer problem in 1952 and suggested that emotional disturbances exist in "many if not all" ulcer patients and are definitely causal in recurrence of chronic ulcer symptoms. Castelnovo-Tedesco (1962), reporting on twenty ulcer patients treated for acute perforation in California, suggested that, where no other serious disease exists, perforation should be taken as presumptive evidence that the patient has tried unsuccessfully to resolve an emotional crisis.

These uncontrolled clinical observations are, however, supported by some epidemiological evidence. Peaks in incidence of acute perforation for peptic ulcer appear at times of heightened anxiety, for instance in the bombing of Britain during the Second World War (Wilson (1942) - Liverpool, Spicer, Stewart and Winsor (1942) - London, Riley (1942) - Newcastle, and Rendle-Short (1942) - Bristol). Milton (1940) showed similar figures when he examined the incidence of haematemesis in the year after the outbreak of war. The material of Illingworth, Scott and Jamieson (1944), and of Jamieson (1955), who examined the incidence of acute perforation in Glasgow during 1924-1953 does not precisely show support for this finding. It shows troughs in the incidence of perforations in the late summer, on Sundays and Mondays, and during the night; that is, during or soon after rest from work. Weir (1960) reported similar findings for the North-East of Scotland, and this is also more or less the pattern

of perforation in Israel (Lazarus, 1964). Suggestive evidence in support of this finding came from Germany where there was a high incidence of ulcer in rear troops, though not in those at the front line (Kalk, 1945), and also a drop in duodenal ulcers in concentration camps was noted, with subsequent rise after liberation (Groen, 1947).

Differences between occupations may indicate a relationship between duodenal ulcer and work fraught with conflict. The effect of occupation can be separated by inference from the general way of life of the workers. Foremen and managers do not share a common social background, but they do share certain job conflicts (Jacques, 1952) and high ulcer rates. Among Scandinavian countrymen who share much of their social background, it is only workers on the land who seem to have low rates for peptic ulcer, and not landowners or those in other occupations (Alsted, 1953). In North-East Scotland, farm workers have a lower rate of known peptic ulcer and of dyspepsia than do farmers. Weir (1960) observes that though these two sections of the community live and work alike, they differ in their worries and responsibilities.

Recurrent conflict is likely to promote anxiety. Doll, Jones and Buckatsch (1951) showed that readily expressed anxiety about work was more common among foremen than amongst others, and among patients with active or inactive duodenal ulcer, than among patients with gastric ulcer or controls. It can be argued, however, that the occupation might not have caused the anxiety. Anxious, conscientious men, might incur a high risk both of becoming foremen and of falling

sick with duodenal ulcers. Miners are also a group with special anxieties, however, and these very different men take up their work for social rather than psychological reasons (Dennis, Henriques and Slaughter, 1956). They too have a high rate of sickness from ulcers.

Increasing interest has recently been shown in the role of anxiety and acid secretion in the formation of duodenal ulcer with the demonstration of the physiological pathways whereby external factors which provoke emotion may reach the gut. Acid secretion is dependent on two known factors: the mass of the acid secretory parietal cells of the mucosa of the stomach, and the stimulus which provokes the cells to secrete (Kay, 1953). Either a large parietal cell mass or an excessive stimulus is, therefore, postulated as a necessary condition for the formation of a duodenal ulcer. Hypersecretion may be accompanied, especially during periods of personal conflict, by a rise in the blood and urine levels of pepsinogen (Mirsky, Kaplan and Broh-Kahn, 1950). This concept offered an experimental approach to the role of anxiety in peptic ulcer. Mahl (1950) demonstrated increased gastric acidity in students during examinations compared with control patients, and stated that the rise was closely related to the degree of conscious anxiety manifested by the students. This finding was diametrically opposed to a previous one of Floyer and Jennings (1946) who could not show that gastric hypersecretion was found in students awaiting final M.B. results. Minski and Desai (1955) demonstrated quite conclusively that in over ninety per cent of patients

with duodenal ulcer the blood pepsinogen concentration is greater than the mean for subjects without ulcer. The concentration in less than ten per cent of the non-ulcer population is greater than the mean of values for subjects with ulcers. If gastric hypersecretion is an essential determinant in the development of duodenal ulcer, it may be postulated that the high pepsinogen secretors represent that segment of the population, with a maximum secretory capacity, which is most likely to develop duodenal ulcer, when exposed to those circumstances responsible for precipitating the sequence of physiological events that result in the characteristic lesion. Accordingly, by choosing the individuals with a high concentration of pepsinogen in the blood, a population that is most susceptible to the development of duodenal ulcer can be selected. Psychoanalytic and other psychological tests permit the evaluation of the unconscious motivations and the style of interpersonal interactions on another parameter involved in the aetiology of peptic ulcer. Thus in 1957, Weiner, Thaler, Reiser and Mirsky demonstrated that a population of individuals with high concentrations of pepsinogen in the blood show intense needs that are principally 'oral' in nature, and which are exhibited in terms of wishing to be fed, to lean on others, and to seek closer bodily contact with others. The population studied was 2073 draftees chosen at random while being processed at induction at any army camp. Yessler, Reiser and Rioch (1959) examined serum pepsinogen levels in 2031 inductees, selected hypersecretors and predicted that this group was at risk for development of duodenal ulcer. At

examination two years later, they demonstrated that this prediction was indeed correct.

Numerous studies have been carried out to examine the response to various stresses of ulcer patients compared with other groups; Mendel (1959) - patients with peptic ulcers compared with patients with anxiety states; Cheli, Gilberti and Dodero (1962) - mental patients with and without gastrointestinal disturbances; Cohen, Silverman, Waddell and Zuidema (1961) - ulcers and controls; Weiner (1962) - controls, peptic ulcers and hypertensives; Wenger (1962) - ulcers and patients with skin disease; Southworth (1958) - peptic ulcers and rheumatoid arthritis; Sines (1957) - ulcers and normals; Ivleva (1957) - ulcers and other illnesses. In general, findings from these studies support Mirsky's hypothesis, but all signs of anxiety regress when the provocation is removed; the evidence is lacking of a continuing effect that could maintain chronic ulceration.

The same criticism can be applied to the study of Sun, Shay, Dlin and Weiss (1958) of one duodenal ulcer patient subjected to repeated stress over twenty-one months.

Eichorn and Tracktir (1958) divided twenty-four subjects into high, middle and low anxiety groups on the basis of their scores on the Taylor Manifest Anxiety Scale. Under hypnosis various emotional states were produced, and it was found that the effect on gastric secretion differed in these groups. From the evidence they suggested that personality predisposition was important, and must be considered in studies of stress.

Glen (1964) studied the acid output in response to histamine in a group of ulcer patients. After clinical blocking of the vagus nerves, only half the group showed diminished response to histamine. He argued that, therefore, ulceration was related to emotions in only fifty per cent of these patients.

Macek and Krejci (1965) examined thirty-two young adults with duodenal ulcers and gastric ulcers. They found that two-thirds were strong and well-balanced personalities, and considered that it was an "over simplification to identify cortico-visceral disease with neurosis". They did not, however, test a 'normal' population.

Animal experiments, using rats; Pare (1962), Sawrey, Conger and Turrell (1956, 1961, 1966), Sines (1959, 1961, 1966), Weininger (1956), Weisz (1957), Otis (1959), Leverat and Lambert (1959), Brodie (1960): dogs; Mahl (1949), Markov (1959), Matthews (1955), Nicoloff (1966), Orndorff, Bergh and Ivy (1935), Slive, Bachrach and Fogelson (1940): and monkeys; Brady (1958), French (1956), Foltz (1964), and Porter (1958): have supported the view that stressors with a psychological content can produce lesions of the stomach and duodenum. For instance, monkeys were placed in circumstances where one of a pair was obliged to assume "executive" responsibility for avoiding electric shocks to itself and the second member of the pair. In each pair the "executive" monkey developed duodenal ulceration and some died from perforations; the passive monkeys did neither (Brady, 1958). An attempt to reproduce these results was unsuccessful; only

one control monkey acquired an ulcer of the upper gastrointestinal tract (Foltz and Millett, 1964).

The general drift of the data on anxiety, therefore, though much of the earlier findings can be severely criticised on methodology, and later findings do not always agree, accords with the role of anxiety as an important factor (possibly more in duodenal ulcers than gastric ulcers) in some ulcers and complication of ulcers.

Avery Jones stated the position as he saw it in 1957. "Chronic anxiety state tends to lead to intractability of ulcer. It is not merely a question of acute anxiety, but with this there is the ability to bottle up an emotional tension - worrying inwardly. It is sometimes difficult to appreciate the degree of frustration or resentment that may be hidden. In practice it is impossible to say how much of a relapse is due to nervous tension and how much to other concomitant aggravating factors". Ten years later his views still hold.

Personality factors in the aetiology of peptic ulcer

Predisposition to peptic ulcer, or constitution, using the term in its widest sense, has been studied from many aspects. That which has aroused the greatest interest in recent years has been the personality of the patient. Chronic anxiety is as likely to have an internal source in personality as an external source. Personality can be conceived as a predisposing factor, and anxiety due to external sources as a precipitating factor in the development of a peptic ulcer.

It has become common for doctors and the laity to refer

to certain persons as being of the 'ulcer type'. It is proposed, therefore, to examine the literature to find evidence whether or not this does exist, and if so, what is the typical peptic ulcer personality. Roth in 1955 summarised the main findings in this field to that date. Tables compiled by him are reproduced (Table 3 - Interview Studies; Table 4 - Psychological Test Studies). The various authors did not agree on the traits and characteristics that distinguished the ulcer personality. Thirteen denied that there was any characteristic ulcer personality; Mittelman and Wolff, (1942), Klein (1948), Kezur, Kapp and Rosenbaum (1951), Kapp, Rosenbaum and Romano (1947), Alexander (1934 and 1947), Kaldegg and O'Neill (1950), Kirsner and Palmer (1952), Bond (1938), Zane (1947), Kahn and Freyhan (1951), Ivy (1950 and 1946), Jordan (1950), and Cobb (1950). Others stated that there were distinctive personality traits but these authors differed among themselves; traits mentioned by some were not mentioned or even contradicted by others (Table 5 - Personality Traits). Three traits, however, were frequently described although none of them was described by as many as a third of the authors; drive, conscientiousness and anxiety. There was also disagreement whether the anxiety was overt or covert. Some authors stated that their patients appeared obviously anxious. Others stated that their patients appeared calm, but when questioned would indicate that they felt restless and impatient. One author noted that his patients appeared calm during the interview, but restless on the ward. Finally

a number of authors did not indicate whether they were describing overt or covert anxiety.

Although traits other than these three were described, the statements about most of them were contradictory. Thus the comments that the ulcer patients were intelligent contrasted with reports that they showed average scores on testing. Similarly the comments about the patient's heterosexual adjustment were all different; good heterosexual adjustment (Sullivan and McKell, 1950); sex problems in only one of thirty-two male patients, but many led undersexed lives (Gainsborough and Slater, 1946); sexual life normal, but adult sexual activities have never meant much to him, and conflicts over masturbation more severe than with others (Wilson, 1939); sexual conflict, mild or moderate in eighteen per cent of patients (Halstead and Weinberg, 1946); none with satisfactory sexual adjustment (women) (Kapp, Rosenbaum and Romano, 1951); almost without exception there are strong signs of severe sexual maladjustment, (Marquis, Dinnett and Winter, 1952); obvious sexual disturbances in five out of ten patients (Modell and Potter, 1949); sexually constricted, with concern about conventional behaviour (Moses, 1946).

In similar fashion, when a number of authors discussed the psychodynamics of the ulcer patients they differed. Having suggested that the ulcer patients had a specific type of conflict they did not agree on the nature of the conflict nor whether it was, or was not, associated with a specific personality type. Many American authors described

essentially the same conflict, although they did so in somewhat different terms. Alexander (1934) suggests that patients' ulcers have a strong wish to be dependent or passive. This desire in most cases is rejected, because it is incompatible with his ego's desire for independence and activity. When this wish to receive and to be loved is thwarted by either the patient's ego or the environment, it becomes converted along regressive pathways into the wish to be fed, which in turn leads to chronic stimulation of gastric function. The following authors, in essentials, agreed with Alexander in the importance of this conflict in peptic ulcer patients, though they differed in whether or not it was associated with a specific personality type; Ruesch, Christiansen, Harris, Dewees, Jacobsen and Loeb (1948), Draper (1942), Draper and McGraw (1929), Draper and Touraine (1937), Mittelman and Wolff (1942), Finesinger (1952), Finesinger and Weisman (1947), Kezur, Kapp and Rosenbaum (1951), Kapp, Rosenbaum and Romano (1947), Halstead and Weinberg (1946), Moses (1946), Rubin and Bowman (1942), Bacon (1934), Levey (1946), Van der Heide (1940), Stone (1947), Brown, Bresnahan, Chalke, Peters, Poser and Tougas (1950), Marquis, Dinnett and Winter (1952), Modell and Potter (1949), Blum and Kaufman (1952), and Saul (1946). Furthermore, in the discussion of dependency in peptic ulcers, some authors suggested that there were two types of patients and stated that these patients differed because of the way in which they handled their passive wishes; one group was openly passive, while the second attempted to compensate for their passivity and, therefore,

appeared ambitious and aggressive; Finesinger (1952), Finesinger and Weisman (1947), Kapp, Rosenbaum and Romano (1947), Rubin and Bowman (1942), Alexander (1934 and 1947), Marquis, Dinnett and Winter (1952), and Blum and Kaufman (1952).

A variety of other psychodynamic patterns were described; duodenal ulcer occurred when something happened and the patient was seeking revenge (Grace and Graham, 1952); familial stresses of everyday life were having a more than normally large effect on the vegetative system of constitutionally susceptible persons (Gainsborough and Slater, 1946); all of thirty-three patients had a sub-acute or chronic conflict of a typical kind, that is, nothing could be done about it except to bear it to the best of one's ability (Winkelstein and Rothschild, (1943); ulcer patients possessed abnormally high needs for security, and conflicts activating fear of insecurity lead to haematemesis (Wilson, (1939); ulcer patients are aggressive obsessionals with certain oral tensions, in whom sublimations have failed in a special way which we do not clearly understand, so that under stress there is a regression to infantile aggressiveness directed to the gastro-intestinal tract (Pickford, 1948 and 1952); there exists in the ulcer patient's unconscious, psychic images of an internalized mother, that harms him precisely in his digestive tract because, as a consequence of his conflicts, he has regressed partially from genital to oral-digestive conflict (Garma, 1951 and 1953); hostility or anger may be responsible for increased acid secretion and ulcer (Szasz, Levin, Kirsner and Palmer,

1947); a man, in encountering obstacles that prove to him a trial and a handicap which he must of his nature endeavour to overcome (Hartman, 1933); ulcer is due to a conflict situation in which the patient feels compelled to perform in a certain manner but fears he cannot (Zane, 1947).

Some of the studies using psychological tests and miscellaneous techniques have yielded results comparable to the above. A level of aspiration test showed that ulcer patients had more drive than the ulcerative colitis patients used as controls (Hecht, 1952). In an uncontrolled study, responses to the Blacky Picture Test brought out evidence for two types of ulcer patient, a primary or openly passive, and a reactive or independent type (Blum and Kaufman, 1952). This same dichotomy was observed by Marquis, Dinnett and Winter (1952) using a battery of psychological tests in a study of peptic ulcer patients, and using as controls a group of psychosomatic patients without gastric symptoms. The results of a human figure drawing test of ten ulcer patients showed evidence of their need for security and conformity as well as their resentment (Modell and Potter, 1949).

Electroencephalograms showed a high alpha index, a sign according to Saul, Davis and Davis (1937 and 1949) of passivity.

Much of this earlier work on personality factors can be criticised. Frequently no distinction was made between patients with gastric ulcer and patients with duodenal ulcer. Wretmark (1953), one of the few investigators who did study them separately found that their personalities differed. The gastric

ulcer patients had no specific personality pattern that distinguished them from controls, whereas the duodenal ulcer patients did have a specific personality pattern.

No distinction was made between male and female ulcer patients. Yet there exists a difference in incidence of ulcer in men and women, so that the personalities involved might be different. Of studies where they are considered separately, Draper and McGraw (1932) considered the women to be more emotionally unstable, Gainsborough and Slater (1946) concluded that they were more frequently psychoneurotic, and Kapp, Rosenbaum and Romano (1951) thought they were more likely than the men to make a poor adjustment to their environment.

The samples from which the ulcer patients were drawn were not representative of the general ulcer population, but conclusions from them have been widened to include all ulcers. In addition the numbers in the studies from which such sweeping conclusions have been drawn are frequently tiny.

Another source of difficulty is one which is present in psychiatry in general, and in particular, in the field of personality research; the problem of definition and terminology. Different workers may be considering the same subject but using quite different terms.

In the majority of studies using projective techniques, the author did not report how often he found a given characteristic, only rarely did he analyse his findings for statistical significance, and generally he reported his conclusions, not his data.

The lack of any control studies is glaringly obvious. Improvements in technique have made possible more reliable

investigations, but they also raise questions concerning the reliability of investigations done in the past. Up to 1955, therefore, the nature or even the existence of the ulcer personality could not be considered established.

It is now proposed to review the more recent literature on the personality of peptic ulcer patients in the light of these criticisms, to see whether any further illumination has been thrown on this confusing subject.

Recent literature on personality factors in the aetiology of peptic ulcer

The recent literature has been studied under two headings.

- a) Clinical studies and
- b) studies using psychological test instruments.

Clinical Studies

The question of dependence and dependency conflicts in peptic ulcer patients has engaged attention.

Goldberg (1958) made an attempt to elucidate emotional relations in the families of thirty-two young men with duodenal ulcer. She compared them with thirty-two controls selected from a general practice. Neurotic traits were common in families of both cases and controls, but certain patterns of relationship were more common in 'ulcer' families. Thus the mothers of ulcer patients tended to have psychogenic symptoms and to be striving, obsessional and dominant at home; fathers tended to be steady, unassertive and passive. Many of the young patients showed a lack of open aggression. Psychologically dependent patients had had dominating mothers who were indulgent and protective; independent patients had

had dominating mothers who were restrictive and protective. This emphasizes the conflict in duodenal ulcer patients between dependence engendered by a powerful mother, and the demands of adult roles. Goldberg herself did, however, warn against generalisations from small numbers. In a controlled Swedish study Wretmark (1960) found that mothers of duodenal ulcer families were often more neurotic than in control families. Fathers of ulcer patients too were often more neurotic and more often addicted to alcohol.

Pflanz, Rosenstein and Von Uexküll (1956) focussed attention on the way patients react to different life situations. Voluntary exclusion or forced expulsion from a community or group coincided with astonishing frequency with the onset of relapse in forty-three out of forty-five ulcer patients, twenty-three of whom declared spontaneously that on these occasions anxiety and insecurity feelings dominated. Van Nieuwenhuijzen (1961) examined the personality and the milieu (family, work and environment) of twenty-six duodenal ulcer patients. He found a strong urge towards independence in patients with a family of their own, which was absent in patients still living with their parents. Bustamante (1959) claimed that social and emotional factors play a part, as do dependence and aggressiveness, in the pathogenesis of peptic ulcers.

Groen, Bastiaans and Van der Volk, in a series of papers published by the Amsterdam psychosomatic school (Collected Papers, 1964), advanced the concept of syndrome shift as a psychosomatic phenomenon. They described the concept as the

consecutive replacement of one syndrome by another. Kissen (1963) quotes statistical evidence of this in a study on tuberculosis patients, in whom he found a higher incidence of peptic ulcer, a higher incidence of neurosis associated with bodily symptoms, and a higher incidence of psychosomatic disorder other than peptic ulcer.

Few modern studies are available of the incidence of psychiatric disability in hospital peptic ulcer patients. Hger-Pederson (1958) compared fifty-one male in-patients with duodenal ulcer with the same number of controls belonging to the hospital's personnel. He found a significantly higher frequency of neurotic features among the former (forty-five per cent as against twenty per cent of the controls). He likewise found alcoholism to be more common among the patients than among the controls, (fourteen per cent against seven per cent). His series, however, might have been selected in some respects. For example, about one quarter of the patients originally chosen had to be excluded because they had not been in hospital long enough to have been examined psychiatrically. Thus the series was to a certain extent selected, as it consisted of patients who had been in hospital for a relatively long time. Since not all patients with ulcer were admitted to hospital, this might add further to the possibility of a certain selection and thereby of a certain limitation of the value of the results. The composition of the control series might also be questioned. Of eighty-two persons, twenty-one had to be excluded because of dyspepsia, and six because they refused to co-operate. The description of these six persons

suggests that their refusal might have been due to neurosis.

Rutter (1963) failed to demonstrate "stress" or emotional trauma as a factor in onset, nor did he find social maladjustment predictive in short term prognosis. Despite these negative findings, symptoms of anxiety and depression proved to be of prognostic value.

De M'Uzan (1960 and 1961) examined 108 consecutive patients admitted to hospital in Paris, forty-three patients with duodenal ulcers, twenty with gastric ulcers, four with duodenal plus gastric ulcers, and forty-one gastrectomized patients. Patients were typed on the basis of a special psychosomatic assessment. He considered that patients with peptic ulceration tend to exhibit a psychological defensive system with a variable balance between active and passive receptive factors. In respect of their sociofamilial relationships, he considered they could be grouped into four psychosomatic types, (1) hyperactive (independent and ambitious), (2) compensated (oscillating between independence and dependence), (3) unstable (alternating between aggression and passiveness), and (4) passive (dependent).

Gastrectomy appeared to precipitate maladaptation more in subjects of type (3) and (4) than in the others, who appear to tolerate it better. In benign ulceration the percentage distribution of groups was almost identical for duodenal ulcer and gastric ulcer. In patients under thirty years hyperactive and unstable types predominated. The unstable type was three times commoner in patients with symptoms of under one year's duration. In patients with gastrectomy passive subjects predominated, and socio-familial

maladjustments were marked in patients over fifty years. He considered further that surgical intervention causes a marked change in the psychosomatic pattern of the ulcer patients with increase in passive types except in original type (2) patients. Social prognosis is nearly always good for type (2). These articles can be criticised for the specialised technique used in assessment, thus making comparisons with other studies difficult. Duodenal ulcer and gastric ulcer patients are not considered separately. Patients were assessed in some cases after operation; and there is no mention of the physical outcome in these cases. Having predicted success or failure in the various groups, he makes no mention of any follow-up procedure as a check on prediction.

Studies with Psychological Test Instruments

Raifman (1957) examined fifteen male peptic ulcer patients, and compared them with fifteen normals, and fifteen psychoneurotic patients for level of aspiration. He concluded that "ulcer patients are an ambitious lot, who cannot achieve their aspiration, because they set goals which to others seem insurmountable". Lieberman, Morton, Stock and Whitman (1959) were in agreement with this, and Cobb, Kasl, Chen and Christenfeld (1965) who examined male patients hospitalised for rheumatoid arthritis, hypertension and duodenal ulcers, with as a control group brothers and brothers-in-law, also commented on achievements, desire for change and impulsive behaviour which was very high in ulcer patients and low in patients with rheumatoid arthritis. Aggressive and impulsive behaviour separated

the groups of patients from their brothers and brothers-in-law.

The theme of dependency and conflicts arising from this has also been studied. Rothstein (1957) compared a peptic ulcer group with normals, psychoneurotics, schizophrenics, and general psychosomatic groups using Rorschach content for dependency and hostility. Peptic ulcer patients scored higher on hostility and dependency than did normals and psychoneurotics, but not more so than schizophrenics and other psychosomatic patients. He argued that specificity theories of conflict are not supported by these results. Wilner (1959) compared thirty male ulcer patients with thirty chronically ill patients, and thirty with acute illnesses. As a measure of dependency they used Murray's Need Succourance and Need Counteraction with the Dependency Scale from the M.M.P.I. In addition, Elias Family Opinion Survey was used as a measure of familial warmth. The prediction that ulcers would score higher than the others on dependency was not confirmed, though in familial attitudes the ulcers differed from the normal and sick control groups. On one test of dependency ulcers and the sick population differed from the control group. It was concluded that ulcers show more frequent evidence of parental overprotection and rejection, and that chronic illness may predispose to dependency, not really the ulcer itself. Dependency needs as a feature of the ulcer group, and the defence against them, was found by Marshall (1960) when he compared ulcer patients with non-gastro-intestinal patients and non-psychosomatic patients. Weiss and Emmerich (1962) using TAT cards found more

conformity but not more dependency fantasy, when they compared ulcer patients with other psychosomatic patients. Deep dependency longings in ulcer patients were found on Rorschach testing when they were compared with patients who had undergone minor surgery (Baugh and Stanford, 1964).

Mullen (1960) using the Pascal-Jenkins behavioral scales, showed that the ulcer group was receiving less gratification from the environment, and scored more highly on deprivation during the first ten years of life (especially paternal deprivation) than did a control group.

Fisher and Cleveland (1960) matched physiological and psychological reactivity in ulcer and rheumatoid arthritis patients. The results in general supported the hypothesis that patients with internal symptoms channel excitation to the body interior and vice versa. Validation of the study was achieved by Williams and Krasnoff in 1964.

That ulcer patients score highly on neuroticism, was noted by Kanter and Hazelton (1964) but they did not differ significantly from a group with ulcerative colitis, and similar high scores in ulcer patients was found by Rapisarda and Romeo (1965).

Poser and Lee (1963) found that they could identify patients with duodenal ulcers, ulcerative colitis patients, and normal controls significantly more often than chance from their responses to four TAT cards.

That psychological factors are related to illness behaviour and not to a specific illness (rheumatoid arthritis, hypertension and peptic ulcers) was shown by Kasl and Cobb (1964).

Silverstone (1966) examined structural personality differences in essential hypertension and peptic ulcer. He postulated that since recent studies with peptic ulcer, alcoholism, obesity, asthma and functional cardiac disorders have demonstrated marked dependency upon the perceptual field, essential hypertension with no symptoms and subsequently no gratification, should differ from a comparative group of peptic ulcer patients with symptoms and subsequent gratification. This he found to be so - patients with essential hypertension were significantly less dependent upon the perceptual field than peptic ulcer patients.

Studies from the literature since 1955 have in fact gone a good part of the way to answer the criticisms that have been made of the earlier literature. They are better controlled, have tried to look at the picture as a whole, and have attempted to study much more carefully defined populations. The literature on the female with ulcers is still remarkably sparse, as is that on patients with gastric ulcer, and not enough care has been taken to say that the great majority of studies are concerned with male duodenal ulcer patients and that generalisations cannot be made to include all patients with peptic ulcer. No further evidence has been put forward to show that either personality or emotions are causal in peptic ulceration. Specific conflicts or a specific personality have not been convincingly demonstrated in peptic ulcer. No predictive study of a personality type which would develop peptic ulcer has been made. The trend has been away from causality towards the

examination of conflicts and personality in established peptic ulcer disease. The hypothesis that emotional factors and personality difficulties influence the course of peptic ulcer has been examined. The picture is also emerging that peptic ulcer disease does not differ so very much from other psychosomatic diseases, and that possibly the personality problems demonstrated are the result of chronic illness and not the cause.

Various studies have linked peptic ulcer with other psychosomatic diseases, and the incidence of neuroticism in their families has been examined. Psychological testing has been carried out comparing peptic ulcer patients with patients suffering from other psychosomatic illnesses, with chronic illness, and with normals. No new conflicts have been demonstrated but rather extension and refinement of work previously done, with valuable information obtained by comparisons. Conflicts and traits, which earlier were thought to be specific to peptic ulcer, have been shown to appear in other populations suffering from chronic disease. Moos (1963) in a careful review of the literature of Rheumatoid Arthritis makes the same observations.

Alcohol

A number of studies have pointed to a high frequency of peptic ulcer among alcoholics. Gosling (1957) found a high prevalence of peptic ulcer among patients who were concomitantly asthmatic or alcoholic. Hagnell and Wretmark (1957) also found a significant association between peptic ulceration and alcoholism. While alcohol could act directly on the gut to

cause ulceration, the effect could just as well be indirect. Alcohol addiction is itself commonly accompanied by emotional disorder, which could provide a psychogenic stimulus to peptic ulceration. For instance, Hagnell and Wretmark (1957) held that in their study peptic ulcer preceded alcoholism as often as it followed it. They noted that sibs of alcoholics were more likely to be alcoholics if the propositi also had peptic ulceration. In a further controlled study of peptic ulcers and their families in 1960, Wretmark found that fathers of peptic ulcer patients were more often addicted to alcohol.

Schmidt (1966) attempted to assess the role of alcohol in peptic ulceration in the experimental situation. Albino rats in an approach-avoidance conflict situation were divided into three groups according to their stomach loadings, a) with dextrose, b) with 10% alcohol and c) with 20% alcohol. No differences between these groups were noted in various experiments. He concluded that alcohol had no effect on the aetiology or severity of gastric ulceration in the rat.

Smart and Schmidt (1962) using age-adjusted accident rates, showed that peptic ulcer patients had significantly more motor accidents than did the general driving population. They noted the possibility that this might have been due to the intervening variable of alcohol.

Smoking

There is a moderate degree of association of peptic ulcer with smoking (Doll and Hill, 1956, Brown, McKeown and Whitfield 1957), and products of tobacco smoke which might

act directly on the intestinal mucosa and through the autonomic nervous system have been suspected of damaging the gut. The evidence is against the supposition that ulcer patients take up smoking to relieve their symptoms, but it is possible that personality type or other factors predispose both to ulcer and to smoking. However, the fact that smoking delays healing and, therefore, maintains the chronicity of ulcers is tentative evidence for some causal effect (Doll, Jones and Pygott, 1958). On the other hand different smoking habits in different environments do not seem sufficient to account for large variations in ulcer rates. For instance, smoking habits could not be made to account for the whole difference in ulcer rates between town and country (Davies and Wilson, 1937).

Study of Parental Deprivation

In the great majority of cultures it is the normal practice for children to be reared by their parents, and there is a general consensus of opinion that it affords an adverse factor in upbringing to be deprived of parents during childhood.

Munro (1966) summarised critically the literature on this subject. He concluded that "parental deprivation may be an important modifying factor in the natural history of several psychiatric conditions, but not perhaps in the rather indiscriminate way that the evidence might suggest. For example, it may on the one hand accentuate the severity of a depressive illness (Beck, Sethi and Tuthill, 1963), but on the other hand accelerate the first onset of schizophrenia

(Oltman, McGarry and Friedman, 1951). In psychoneurosis, parental disharmony rather than actual parental loss may be of importance (Ingham, 1945) but in suicide and attempted suicide both parental deprivation and disharmony appear to be prominent (Simon, 1950; Batchelor and Napier, 1953). A rather subtle interplay or influence is suggested with parental deprivation possibly aggravating an already-present predisposition to illness. This seems more feasible than accepting that a single type of event may, of itself, be a cause of practically any psychiatric condition."

Munro examined 153 depressed in-patients matched with 163 psychiatrically normal controls (from medical and surgical out-patient clinics) and concluded that the groups did not differ with respect to parental loss, though severe depressives seemed more liable and moderately severe depressives less liable to have lost a parent by death before the sixteenth birthday when compared with the normal controls.

There is one study of loss of parents in childhood among peptic ulcer patients. Kellock (1951), in a controlled study, revealed no difference between 250 ulcer patients and 250 other hospital patients in experiences of early separation from parents.

When it is considered that parental deprivation in all likelihood aggravates a predisposition to psychoneurotic illness, and that psychological factors play an important role in peptic ulcer, this negative finding is rather unexpected.

The evidence of two further studies, though not

specifically concerned with peptic ulcer, should be balanced against this.

Barry and Lindemann (1960) examined 947 neurotic patients, considered that an excess of childhood bereavement was present, and claimed that their results showed a significant relationship between psychoneurosis and death of the mother before the subject's fifth birthday, especially for females. Unfortunately they based their results on patients diagnosed as having 'psychoneurosis' or 'psychosomatic disorder' and did not differentiate between these categories. Gay and Tonge (1967) reported a study designed to test the hypothesis that loss of parents in childhood would predispose to psychogenic rather than endogenous illnesses in later life; so that a history of childhood deprivation would be found more frequently in patients suffering from neurotic and personality disorder rather than psychoses. They considered that their results showed significantly higher parental loss in their psychogenic group (reactive depression and personality disorders) compared with patients suffering from endogenous depression. Reactive depression was found to be associated with loss by death of the parent of opposite sex. In neurosis, reactive depression or personality disorder, loss of mother was found more frequently in the first five years of life, while loss of the father was more frequent in the age groups five to fourteen years.

Study of the literature, therefore, suggests that no definite knowledge exists of the influence of parental deprivation on peptic ulcer. The suggestion is made that further research would be rewarding.

Summary of present day knowledge of the role of psychological factors in the aetiology of peptic ulcer

No one specific factor has been definitely demonstrated to be causal in peptic ulceration.

Few, however, would doubt that emotional trauma, like other forms of stress, acts as an important aggravating factor, and may indeed precipitate a relapse or a complication of the disease.

Specific conflicts or a specific personality have not been demonstrated in peptic ulcer, but that personality difficulties influence the course of peptic ulcer is established.

Peptic ulcer has been linked with other psychosomatic disease, with alcoholism, and with patients suffering from chronic diseases. The picture is emerging that similar personality problems and psychiatric disturbances occur throughout, and that possibly some may be the result of chronic illness and not the cause. This last finding points to the danger of observing a disease in isolation, and of drawing conclusions that such observations are specific to that disease.

Differences have been observed between men and women with ulcers, and between duodenal and gastric ulcers.

All studies agree that anxiety plays an important role though it may differ in degree between the sexes and between duodenal and gastric ulcers.

The suggested definition, under which it was proposed to regard peptic ulcer as a psychosomatic disease, with its

presumption that psychological factors play an important part but are not the sole aetiological agents, can be seen to be as far as it is possible to go in the state of present knowledge of peptic ulcer aetiology.



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Epidemiology of Peptic Ulcer

Only epidemiological studies which have been concerned with peptic ulcer patients admitted in hospital are considered in this section.

Limitations in application of the epidemiological method

Before proceeding to discuss epidemiological studies in relation to peptic ulcer, some discussion of the conditions which limit the use of the relevant epidemiological data may set it in better perspective.

To establish reliable frequencies is a complicated task in most chronic diseases. The several available measures often yield divergent results. Sometimes this is because each is measuring something different; sometimes because the instrument of measurement is inadequate or poorly handled.

An example of this is the large scale survey in the United States National Health Survey (1960) in which respondents in a national sample report illnesses experienced in the preceding twelve months. Nineteen per cent of the respondents known to have been hospitalised for peptic ulcer failed to report the hospital episode and the frequency of under-reporting increased as the event receded into the past.

A handicap entailed by short cut methods (for example, blood pepsinogen levels) in the diagnosis of peptic ulcer is that they cannot yet discriminate between gastric and duodenal ulcer. Much besides the difference in site suggests that these are separate if related entities, because they diverge in frequency by age, sex, social class and though time, as well as in the mean levels of acidity in the stomach.

Studies of the incidence of peptic ulcer derived from

hospital figures can be suspect. The source of data in these is one particular segment of the medical care system, and the potential case has already entered the service in search of help. Accurate diagnosis is more easily achieved than in prevalence studies. Cases accumulate at a focal point in numbers that permit analysis by many variables. But this population can rarely hope to be representative of the population from which the patients were drawn. In incidence studies of diseases, insidious in onset and slow to declare themselves, effective means have yet to be found of controlling the bias of self-selection and of social selection of patients.

Furthermore, individual clinical diagnosis, like some of the standard screening methods is also subject to error (Dunn and Etter, 1962). Incidence studies derived from the sample group of patients from whom a definite diagnosis is reached in hospital following radiology, gastroscopy, and complications such as haematemesis and perforations, may avoid some of the vagaries that arise from subjective judgments, but they will be biased in yet other ways. These definitive events are not representative of all ulcers, and the risk of their occurrence is not the same for all age and sex groups, and for all types of ulcer. Complications occur in more patients with gastric than with duodenal ulcer, in more men who have ulcers than women, and in more old people than young (Johnson 1962; Doll, 1952). The statistics will, therefore, reflect these characteristics rather than the distribution of peptic ulcer in the general population.

The distorting factors in a series of ulcer cases drawn from any medical service include the attitudes and training

of doctors, the facilities available to them, and the purpose for which they are examining their patients and marking their records. For example, Watkinson (1960) found the incidence of lesions recorded in Leeds during the period 1920-1939 by Stewart, a pathologist with a particular interest in peptic ulcer, was more than double that recorded by a number of pathologists in a prospective national necropsy study in 1956. The unrepresentative nature of hospital statistics, therefore, enjoins caution in interpretation.

Incidence of peptic ulcer in hospital

Effects of sex, site of ulcer, and age

Variations in the ratio of gastric to duodenal ulcer or in the ratio of males to females with peptic ulcer are frequently a more reliable guide to difference between hospitals, than absolute frequencies expressed as incidence or prevalence, since comparisons based on cases alone can avoid some weaknesses in inadequate denominators. It should be borne in mind, however, that these ratios may vary between hospitals of different countries because men and women, or the different social classes are not equally represented among hospital patients.

The following list of incidence figures culled from hospital statistics is representative but by no means exhaustive;

Urquhart, Singleton and Feasby (Canada), 1941; ninety-six per cent duodenal ulcers, four per cent gastric ulcers. Somervell (South India), 1936; five per thousand duodenal



ulcers; gastric ulcers much less frequent.

Jones and Pollak examined all new ulcer patients, both in-patients and out-patients, referred to the Central Middlesex Hospital, London; the gastric duodenal ratio for men was 1/3.1 and for women 1/1.2.

Sex ratios were male/female = 2.4/1 for gastric ulcers and 6.8/1 for duodenal ulcers.

Ihre and Muller (Stockholm) 1930-40; duodenal ulcer/gastric ulcer = 3.5/1.

Gainsborough and Slater (London), 1946; seventy-two males and twelve females with duodenal ulcer, and gastric ulcer thirty-three and twelve.

Tidy (London); gastric ulcer at all ages 2.6 males to one female, and duodenal ulcer 8.4/1.

Markoff (Switzerland) 1943; duodenal ulcer/gastric ulcer = 1/1.

Daintree Johnson conducted a ten per cent survey of all hospital admissions for peptic ulcer in England and Wales during 1956 and 1957, and obtained the following figures:-

2774 male gastric ulcers; 1533 female gastric ulcers.

4811 male duodenal ulcers; 1344 female gastric ulcers.

Duodenal ulcer + gastric ulcer = 227.

Visick (York) 1948; male/female, 6.6/1. Similar ratios for gastric ulcer, 2/1, duodenal ulcer 9.2/1, duodenal ulcer + gastric ulcer 5.4/1.

duodenal ulcer/gastric ulcer = 3.6/1 (males 4.2/1, females 1.5/1).

Jamieson, Smith and Scott (Glasgow) 1946-48; at nearly

all ages and in both sexes the ratio of duodenal to gastric ulcers is from three to four times higher in Glasgow than in London, and the proportion of female ulcers is higher at both sites. |

Almost everywhere sickness from duodenal ulcer is reported as more common than from gastric ulcer, although gastric ulcer causes as many deaths as duodenal ulcer or more. In all these studies males have been the chief victims, though gastric ulcer is relatively more common in women. The actual ratio of male to female varies with the geographical distribution.

An exception to the rule of prevalence of duodenal ulcers in males was noted in a study by Dahl (1948) who compared incidence of ulcer in the patients of a Danish and a Norwegian hospital of the same size. In the latter hospital, gastric ulcer was much more frequent than duodenal ulcer among the male patients.

Patients with ulcers admitted to hospital are middle aged or elderly. Visick (1958) noted that the age-group with the highest number of patients was forty to forty-nine, and that the peak incidences of gastric ulcer and duodenal ulcer + gastric ulcer were a decade later. Gainsborough and Slater's (1946) group was a little younger with mean age for duodenal ulcer 39.20, and for gastric ulcer 38.97, but a factor in this may have been the highly selected nature of their peptic ulcer group. Figures given by Daintree Johnson show that in England and Wales admissions for gastric ulcer (neither bleeding nor perforated) were at a peak in the fifty-five to sixty-four period in men, and in the

sixty-five to seventy-four period for women. Uncomplicated duodenal ulcer admissions reached a peak in the forty-five to fifty-four age group in both sexes.

Effect of urbanisation

The incidence of gastric and duodenal ulcer in both sexes was found to be higher in the town than in the country (Pulvertaft, 1959; Doll, Jones and Buckatzsch, 1951).

Studies on hospital populations, usually in the incidence of patients admitted for perforation, have confirmed this finding; Morris and Titmuss, London, 1944; Litton and Murdoch, South-West Scotland, 1963; Weir, North-East Scotland, 1960, and Alsted, Scandinavia, 1953.

The higher urban rate is probably not dependent on the availability of medical care (Doll, Jones and Buckatzsch, 1951).

Time Factor in Incidence of Peptic Ulcer

It has been noted that at the present time all peptic ulcers, but especially duodenal ulcers are commoner in men. The difference between the sexes tends to decrease after the menopause (Knutsen and Selvaag, 1947 and Watkinson, 1958), which may offer support to the hypothesis that endocrine factors may protect against the development of ulcers.

The present picture has not always obtained, however. Indeed great changes in North-West Europe during the past 150 years in the age and sex incidence suggests that over this period there have been three observable syndromes; perforations of acute gastric ulcers in young women; perforations of duodenal ulcers in young and middle-aged

men; perforations of gastric ulcers in older men and women (Jennings, 1940).

About the beginning of the nineteenth century reports began to appear with increased frequency concerning perforations. Young women were the chief sufferers. Half of all perforations occurred in women in their twenties, and these reached a peak in the second half of the century. The cause appeared to be acute gastric ulcers and death was inevitable (Jennings, 1940; Jones, 1947). By the end of the century this condition had begun to disappear (Levij, 1959; Kucsko, 1958).

The common perforation of today, chronic juxta-pyloric ulcers, began to assume importance at the beginning of the twentieth century. Gastric ulcers near the pylorus began to affect men and older women, and perforations from these reached a maximum about the time of the First World War. In Scotland, Illingworth, Scott and Jamieson (1944) noted that hospital admissions between the 1914-18 and 1939-45 wars remained constant. Round about the turn of the century duodenal ulcers began to make their appearance in young men and then later in middle-aged men. From then on until very recently many different sources in Europe (Levij, 1959; Watkinson, 1960; Illingworth, Scott and Jamieson, 1944; Bager, 1929; Alsted, 1953) have confirmed the increasing frequency of the duodenal ulcer syndrome.

For these reasons peptic ulcer has been called a disease of civilization, and many authors have explained its increase as due to the increasing stress and strain of modern life. However, in the last decade in Britain, signs are beginning

to appear that the disease had passed its peak, and is beginning to decrease in frequency (Susser, 1961; Susser and Stein, 1962).

A halt in mortality from gastric ulcer was noted in the early 1950's by Doll, who ascribed it to better treatment. That this has continued has been confirmed from statistics from general practice, from the army, from insurance statistics, or sick absences, or from material on hospital statistics relating to perforation and elective surgery (Morris, 1964).

Similar trends have occurred in duodenal ulcer, but followed a few years behind. Death rates did not level off till the mid-1950's (Pulvertaft, 1959; Morris, 1964).

In England, therefore, it seems possible that there is a recession of the peptic ulcer syndrome, which at first affected age groups unequally. Since the Second World War both mortality and perforations have declined in the younger age groups, although until recently they were still rising in the older age groups. Possibly this may be an effect of environment. Different age groups experience different environments; the wave of peptic ulcer is decreasing in the young because they have been exposed to an environment different from that of their elders, but it is still manifest amongst the older people who experienced the earlier environment. Weir's data on mortality by social class and perforations (North-East Scotland, 1960) and Jamieson's (West of Scotland, 1955) are consistent with the hypothesis, and Mackay (1966) continuing Jamieson's study, is in agreement. Mackay also has shown a continuing rise

in the mean age of those admitted to hospital and a decline in their numbers. Possibly improved surgery may be affecting these figures also.

Signs of a decline in morbidity have appeared in a number of other European countries and also in Japan. Thus peptic ulcer cannot be regarded simply as a disease of civilization, in the sense that the stresses of life today are certainly not getting any less. On the other hand peptic ulcer may be a disease of any early phase of urbanisation. It is tempting also to speculate that specific historical events may have effected the disease. For example, the Second World War, and the unemployment in the 1930's, roughly fit the fluctuations for the male age groups most likely to be affected. The victims of the First World War roughly fit the generation with the highest peptic ulcer death rates. It has been shown previously in the section on anxiety factors in aetiology that the immediate effect of war is evident in the rise in perforations which followed air raids. Is it too far fetched to speculate that in chronic peptic ulcer acute events might precipitate prolonged effects?

Variations in the incidence of admissions for perforation occur throughout the year. Perforations more frequently occur in December both in London (Spicer, Stewart and Winsor, 1944) and West Scotland (Jamieson, 1955 and Mackay, 1966). In contrast, Webster and Weir (1958) report from the North-East of Scotland that perforations occur more frequently in summer, and the sharp rise in incidence

during December which is found in Glasgow does not occur. Interesting short term variations in the frequency with which perforations occur in Scotland have been demonstrated in Glasgow. They occurred most frequently on Friday and Saturday, while they were uncommon on Sunday or Monday. During a twenty-four hour period they occurred more frequently towards the end of the morning and the end of the afternoon.

No real reason is known for these periodic variations, and none of the various theories which have been put forward to explain them is satisfactory.

Social Class and Occupation in incidence of peptic ulcer

Occupation is frequently taken to be a main indication of social class, and in Britain the Registrar General has devised a means of using occupations as an index of social class by ranking them into five separate categories according to social prestige. It can be presumed that these social classes have different environments, and as might be expected, peptic ulcer incidence shows differences depending on the social class of the patients.

These differences have been complicated by the change in peptic ulcer incidence during the past generations. In the case of gastric ulcer in men in England and Wales, the mortality statistics by social class suggest that there may have been, in cohorts born before about 1860, a rate of gastric ulcer deaths as high in the upper social classes as in the lower; among later cohorts the high rate of mortality shifted to the lowest social classes. The

figures for duodenal ulcer show the same pattern, but occurring a decade later (Susser and Stein, 1962). The available morbidity studies are not inconsistent with these patterns (Doll, Jones and Buckatzsch, 1951; Pulvertaft, 1959).

Particular occupations have long been considered to run a high risk of developing peptic ulcers, for example, transport workers and bus drivers. Neither Doll, Jones and Buckatzsch (1951) nor Weir (1960) in their studies found that this was so.

Doll et al (1951) surveyed 5951 persons, most of whom lived in London. An excess of peptic ulcer was found among doctors, and among those in responsible positions in industry. Dalhamn (1953) found a high liability to peptic ulcer in sea-pilots in Swedish sea ports, and among them the highest rates occurred in those with the longest working hours. Agricultural workers had a low morbidity which conforms with their low mortality rates. This finding has been confirmed by the Department of Health for Scotland (1935), Ginannschì from Italy (1938), and Stewart, Webb and Hewitt (1955). Weir further noted that farm workers in the north-east of Scotland had a low rate of perforations, while farmers had a high rate. He considered that the factor of 'responsibility' might be operating.

Difficulties are found in attributing a causal factor; either men with ulcers might select particular occupations, or worry and stress might precipitate the ulcer.

Different studies have not always been compatible with one another. Other studies besides that of Doll et al have

reported high rates of duodenal ulcer among foremen and executives (Vertin, 1954; Pflanz, Rosenstein and Von Vexkull, 1956; Gosling 1951), but from America, Dunn and Cobb (1962) found a high rate of peptic ulcer in foremen but not in executives, and Weir from the North-East of Scotland found a lower rate of perforations among executives than he would have expected.

Summary of findings of epidemiological studies

Epidemiological studies of patients admitted to hospital with peptic ulcer are dependent on factors inherent in the disease itself, social selection of the patients, and clinical errors depending on both medical staff and the recording system available.

Despite these cautionary remarks, it is obvious that these studies have increased our knowledge of this baffling disease.

1. Duodenal ulcers are commoner in hospital practice than gastric ulcers.
2. Duodenal ulcers are predominantly male while relatively more females have gastric ulcers.
3. Peptic ulcer patients admitted to hospital are predominantly middle-aged or elderly.
4. Patients admitted to hospital with perforated peptic ulcer have been studied extensively.

Investigation of these patients has provided conclusive evidence of difference in incidence of the disease through time; from generation to generation, throughout the year and throughout

the week. Incidence of perforation also varies geographically; more perforations occur in urban compared with rural areas. Incidence of perforation, it is suggested, may vary with occupation.

Thus variations across space and through time in patients with peptic ulcer admitted to hospital suggest the need for caution in comparisons between studies too widely separated in these dimensions.

These differences in peptic ulcer in different geographical, historical and social contexts suggest the influence of varying ways of life in this disease. Furthermore, that psychological factors contribute towards these differences, has been suggested by numerous workers.

Relationship between Physical and Psychiatric Symptom

Physical Illness in Psychiatric Patients

It has been shown that psychogenic factors play an important role in the aetiology of peptic ulcer. It follows, therefore, that psychiatric patients might be expected to show a high incidence of peptic ulcer, and in particular in those patients admitted with psychoneurotic illness.

Many studies in this field have been concerned with psychotic patients only. Henry (1924), Phillips (1937), Rosenbliett and Manley (1940), Moss, Hay and McLowell (1950) and Brosin (1952) all show an incidence of less than two per cent for peptic ulcer in psychotic patients. But no description of the age and sex structure of the population at risk was given in these studies, nor was there any mention of a control series.

Swartz and Semrad (1951) did distinguish between psychotic and non-psychotic cases but they did not separate peptic ulcer from a collection of psychosomatic disorders. They considered that no significant difference was apparent in the incidence of psychotic and non-psychotic illness in this group of psychosomatic conditions.

Although West and Hecker (1952) having surveyed the literature, came to the conclusion that peptic ulcer is common amongst psychotic patients, it can be seen that the literature provides no very reliable evidence for this statement.

Investigators have also studied the question of a possible association between peptic ulcer and a particular

kind of mental disorder. Lovett Doust (1952) showed by means of a questionnaire that the incidence of physical disorder was higher in psychiatric patients than in a control population of mentally healthy individuals. In addition, he showed that there was a positive correlation between the incidence of peptic ulcer and the diagnosis of affective psychosis (depression), and a negative correlation between its incidence and schizophrenia and psychoneurosis. Possibly, however, his statistical methods were not above question. Wretmark (1953), from a study of the personality of peptic ulcer patients, predicted what sorts of mental disorder they would be most prone to, and Gosling (1958), in a survey of mental patients, showed that the incidence of peptic ulcer was low among psychotics and higher amongst neurotics. The low figures for psychotic patients was due to the low incidence amongst schizophrenics, and the figures for neurotic in-patients due to the high incidence of ulcer in depressed patients, alcoholics and asthmatics. On the other hand, Wretmark (1960), having shown in 1951 a greater familial tendency for duodenal than for gastric ulceration, examined the families of patients with peptic ulcer but could find no evidence of a lower incidence of psychosis.

Marshall (1949) and Herridge (1960) both studied the incidence of physical disease in a consecutive series of psychiatric in-patients in St. George's Hospital, London. Both considered that in a high percentage of cases the patients had a physical illness which had contributed to the psychiatric state (twenty-two per cent and twenty-one per cent). The presence of three ulcers only was noted

in Marshall's series of 175 cases. But it is noticeable that interest was being aroused in the interaction of physical and psychiatric disease in the same patient.

This concept was further studied in 1961 by Roessler and Greenfield. They examined 471 university students seen at a psychiatric out-patient clinic, and compared them with 480 controls for the incidence of thirteen categories of disease. From their figures they concluded that the neurotic group showed more physical disturbance than did the healthy group at appropriate statistical levels of confidence.

Cheli, Gilberti and Doderio (1961) studied twenty-three patients suffering from psychiatric disorders of various types by means of gastric biopsy, secretory and radiological findings. Of their twenty-three patients, three had duodenal ulcers, two had duodenal diverticula, and at biopsy approximately half the patients had gastritis. Results of the ^{gastric} secretion test showed frequent hypofunction, and the investigators concluded that they had confirmed a relationship between psychiatric stress and visceral function. The lack of a control group makes the conclusions of this study very difficult to assess.

Siurala, Stenback, Pingoud, Vuorinen and Nyberg (1964) examined a socially deviant group (318 prisoners) and compared them with 945 hospital out-patients and 328 factory workers. Upper abdominal complaints, headaches and insomnia, and psychic disturbances were significantly higher in prisoners. Active peptic ulcers were equally distributed amongst all three groups, but healed ulcers were more

frequent in prisoners. One hundred prisoners had abdominal complaints, and this particular group showed more abuse of alcohol and history of drug addiction, more headache, insomnia and sweating, more cold extremities, a less active stomach with lower acid secretion, and a higher uropepsin excretion when they were compared with the others.

One of the very few recent studies with the deliberate aim of examining ulcer patients for the presence of psychiatric disorder was that of Høger-Pederson (1959). He examined the records of male patients with duodenal ulcer admitted to the Psychiatric Department of Kommunehospitalet, Copenhagen, during the years 1936 and 1956. During 1956 forty-eight patients were treated and they had had on average 4.4. admissions to a psychiatric institution per patient. By far the greatest number had had a gastrectomy (thirty-two). Alcohol addiction was present in thirty-six; drug addiction in nine; anxiety neurosis in thirty-four; attempted suicide in fifteen; observation for psychosis, and psychosis, sixteen; criminal offence, twelve. He emphasized that on closer inspection of the records, anxiety states were prominent in almost all the patients and he evaluated their personalities as "neurotic personalities of the dependent-independent type". Unfortunately he does not separate peptic ulcer patients from gastrectomised patients, and in emphasizing the high rate of alcohol addiction in these patients he does not know the total population of gastrectomised patients from which this sample was drawn. The study also suffers from being retrospective and utterly dependent on the case records. There

is no explanation why, on a second persual of the case records, the investigator could diagnose anxiety in almost all the patients.

Thus the literature on the subject of incidence of peptic ulcer in psychiatric patients does not rest on very firm foundations, and findings are not very helpful, though the suggestion that peptic ulcer and psychoneurosis are associated has emerged from the studies of a few workers.

The possibility of interaction between physical and psychiatric symptomatology has been examined, and findings, such as they are, suggest that such a relationship does exist.

Incidence of Psychiatric Symptomatology in the General Hospital

To find out if the ulcer patient is unique in that he shows a pattern of emotional and personality problems, other population groups have been studied for evidence whether or not they too suffer in this way.

As the subject matter of this thesis concerns patients with peptic ulcers referred to a general hospital, patients referred to general hospitals with other diseases have been considered, and in particular those studies which have included peptic ulcer patients in their hospital groups.

One of the earliest to call attention to the large number of medical patients with psychiatric problems was Cabot. In 1907 he noted that forty-seven per cent of patients had recorded diagnosis of "functional disease". The incidence of "psychiatric illness" has subsequently

been reported from private clinics. Moersch (1932) noted that forty per cent of his average clinical material had some psychiatric problem, and Kaufman and Bernstein (1957) considered that 81.4 per cent of their patients had psychological factors as the basis for their complaints.

Investigators have also reported incidence figures from general hospital out-patient clinics; Pearson (1938) noted that sixteen per cent had psychoneurosis; Roberts and Norton (1952) diagnosed psychiatric illness in seventy-two per cent of their out-patients, and gave the figure that eight out of eleven patients with psychosomatic disorder had a positive psychiatric diagnosis; Mestitz (1957) considered that twenty-seven per cent of clinic attenders had functional disease; Culpan, Davis and Oppenheim (1960) and Priest (1962) suggested that neurotics constitute a quarter of out-patients at a general hospital; Mannocci, Friedman and Kaufman (1961) examined all out-patients of more than ten years' standing and concluded that 73.5% had psychiatric illness.

Besides these morbidity studies of small segments of the population of medical practice, there have been numerous reports of "psychiatric illness" in selected patients attending the doctor, for example, in those with hypertension, duodenal ulcer and "psychosomatic disorder" (Wolff 1953).

Rud (1953) at the general hospital in Bergen showed that 4.8 per cent of medical in-patients over three and a half years were referred to the psychiatric department.

The reported rate of psychiatric morbidity rises steeply when such populations are examined by a psychiatrist. Helsborg (195⁸₄) when he examined 500 in-patients of a Scandinavian hospital, concluded that twenty-two per cent were suffering primarily from psychiatric illnesses and psychosomatic disease, while Roberts and Norton (1952) found that three-fifths of a sample of new medical out-patients of a general hospital in Connecticut were suffering from functional complaints. Zwerling et al (1956) considered the mental health of only one in ten surgical in-patients to be satisfactory.

The very diversity of measures and definitions have, however, made comparisons between these studies virtually impossible. Measures have varied from clinical interview, assessment of old records, to use of questionnaires and personality tests. For example, when the Cornell Medical Index was the measure of psychiatric illness, seventy-three per cent of all medical out-patients were found to have such complaints, but when the clinical diagnosis was used the amount of psychiatric illness dropped to thirty per cent (Brodman, Erdmann, Longe, Gershensen and Wolff (1952)). Furthermore, some investigators have considered all out-patients, while others have been interested only in those patients in whom no organic disease has been demonstrated. For example, Kreitman, Sainsbury, Pearce and Costain (1965) in a psychiatric clinic established in a general hospital asked consultants to refer patients whose somatic symptoms could not be substantiated by clinical organic findings.

They found that depression accounted for by far the largest number of these patients. They did, however, hypothesize that depressed patients with somatic complaints would have a greater tendency to develop psychosomatic disorders, and this was confirmed by their findings that twice as many clinic patients compared with controls gave a history of classical psychosomatic illness. Thus, in estimating the incidence of neurotic illness in general hospitals, those same factors, which have already been noted in the section concerning epidemiology, have been present and have limited the usefulness of these studies.

Agreement, however, has been reached that a significant proportion of patients referred to a general hospital have psychiatric symptoms.

Some investigators have approached the problem from the point of view of the reasons why these patients sought medical help. Stevenson (1930) examined 150 patients coming to a gastroenterologist, twenty-four of whom had ulcers; thirty-three per cent listed anxiety as their chief reason, fifty-one per cent, discomfort, and sixteen per cent had mixed motives. He considered emotional problems to be present in seventy-five per cent of the group; severe, nineteen per cent, moderate, forty-five per cent and subsidiary, eleven per cent. Reynolds (1930) concluded from a similar study that "the practitioner of medicine should evaluate the relative importance of the organic and functional elements of each case and treat the two simultaneously". Stoeckle and Davidson (1962) commented "our observations indicate that patients most often come

to the clinic with bodily complaints, which on further study appeared to be one aspect of emotional reactions to recent traumatic events", and that "depressive responses predominated among patients seen in our clinic at the time of their initial visit". In a further study in 1964, the same authors suggested that over eighty per cent of patients coming to a general medical clinic were motivated by psychological distress. Martin and Swenson (1966) postulated limited intelligence as the psychodynamic stress in their out-patients, but they limited their investigation to functional disorders only. Querido (1959) and Shepherd, Davies and Culpan (1960) emphasized the important role played by social and/or psychic stress not only in referral but also in outcome of treatment, a fact which had been previously noted in 1947 by Brodman, Mittelman, Wechsler, Weider and Wolff in their studies of duration of convalescence in patients with acute respiratory infections.

A group of studies has dealt much more specifically with the problem of the incidence of personality disturbance and emotional disorder in psychosomatic patients, and have included peptic ulcers in their groups. Yaskin (1943) discussing the complexities of this field, observed "the co-existence of organic gastro-intestinal disease and neurotic symptoms is well known and their aetiological relationship is often difficult to evaluate". Mittelman, Weider, Brodman, Wechsler and Wolff (1945) studied personality and psychosomatic disturbance in patients in medical and surgical wards. The patients were divided into mild, moderately severe, and severe personality and

psychosomatic disturbances. Ten per cent of the group were rated as severe and moderately severe, and twenty per cent, mild. Thirteen peptic ulcer patients were included in the total group, ten of whom were rated as having readily discernible psychopathology. The writers considered that the patients' difficulties arose in connection with a threat to bodily safety, frustration of dependency needs, hostility, sex and failure to attain ambitions. All had conflicts between group ideals and desire for protection. Tipler (1948) in a discussion paper entitled "The Extent of Neurosis" considered "a very large number of the patients suffering from a definite organic complaint were also affected by a strong subjective element due to their anxiety about their health, or anxiety about the effect of their illness on their economic conditions". In a very long and careful article Helsborg (1958) surveyed patients admitted to the Medical Department of the Aarhus Country Hospital, Denmark. He endeavoured to answer the following questions, 1) what psychiatric disorders are encountered in a medical department, 2) how often do they occur, and 3) what is the significance of psychic stress to the organic symptoms and the actual organic disease. Included in his group were twenty-four patients with duodenal ulcer, fourteen with gastric ulcer and two with duodenal ulcer + gastric ulcer. He considered that, in males as well as females, duodenal ulcer is psychogenic in about twenty-five per cent of cases, whereas only one female out of three, and one male out of eleven had

psychogenic gastric ulcer. He noted that of the six male patients with strenuous work as the eliciting psychic trauma five had peptic ulcer and one chronic gastritis. In addition all six carried considerable responsibility. Patients were followed up eighteen months to four years later. Of the females with psychosomatic disease about half were unchanged and half improved or cured, and none were worse. The corresponding values for the males were more than half unchanged and more than one third improved or recovered. He noted that in the peptic ulcer group, symptoms continued with the same intensity despite removal or amelioration of the psychotraumatic condition which thus had produced irreparable changes. He compared his results with two studies from Norway (Horn, 1952; Laane, 1951) and one from Denmark (Stromgren, Torken, Anderson and Schiødt, 1955). Laane found psychosomatic diseases to be commoner in men. But in other respects findings in the three studies were roughly comparable. Helsingborg concluded that "the not uncommon totalitarian view that certain diseases are invariably psychosomatic we cannot accept. We demand an adequate psychogenesis in each individual case". One criticism of the study is the difficulty of eliciting aetiological psychogenic trauma in long continued chronic diseases such as he studied. It has been noted that the patients had a considerable length of history before entering hospital, and the difficulty of deciding from the patient's history alone, what some years back had caused the disease, must be open to considerable subjectivity.

Kellock (1951) studied 250 patients in a general

hospital and compared them with 250 ulcer patients. He found no differences between the groups in such characteristics of the family as upbringing, number of children and composition, in social class, or in educational standard or incidence of childhood illness.

Sainsbury (1960) carried out an investigation into psychosomatic disorders and neurosis in out-patients attending a general hospital. He wished to examine the hypothesis that psychosomatic disease is a distinct and valid entity, and secondly to inquire whether a personality factor may be aetiologically significant in those patients with physical illnesses operationally designated "psychosomatic". As tools of measurement he used neuroticism and extraversion, two independent dimensions of personality identified by Eysenck (1947, 1952). All patients attending eleven clinics at two general hospitals were asked to complete the Maudsley Personality Inventory (designed by Eysenck, 1959). Findings showed that both the psychosomatic and possibly psychosomatic groups had significantly higher scores on neuroticism than had the controls. Thirty diagnoses in these two groups were separately examined; patients with twenty-two of the diagnoses had significantly higher neuroticism scores than had the controls. Peptic ulcer was included in the psychosomatic group; Neuroticism in these patients was higher than in the control group, but did not differ significantly from the controls. Sainsbury commented that his peptic ulcer sample was small and not wholly satisfactory, as the diagnosis had not been confirmed radiologically in about one third of the patients. The

psychosomatic group was significantly more introverted than the controls, but this did not hold with the possibly psychosomatic group. Again though peptic ulcer patients scored lower than the controls on extraversion the difference was not significant. Patients with chronic serious and disabling diseases did not differ from the controls on neuroticism. It was concluded, therefore, that, as in a representative sample of out-patients those with psychosomatic diseases could be differentiated from those without on both neuroticism and extraversion, psychosomatic diseases should be considered to be a distinct entity and that the difference was not due to chronicity. That the findings on peptic ulcer were equivocal is disappointing from the point of view of this discussion.

Studies from general hospitals have in the main shown that a significant proportion of referred patients have emotional illness. Though more investigations have been devoted to functional disorder, the concurrence of both physical and psychiatric illness in the same patient has received a good deal of attention. Sainsbury's study has shown how to distinguish psychosomatic disease from other diseases, and incidence of psychiatric illness is generally agreed to be higher in the former.

It has, therefore, emerged that peptic ulcer patients are not alone in showing evidence of psychiatric illness, and consequently conclusions drawn from a group of these patients must be viewed in perspective against this background knowledge.

Treatment of Peptic Ulcer

There are two main subdivisions in the hospital treatment of peptic ulcer. The patients can be treated medically or surgically. In this survey of the literature the problem of treatment has been examined under these two headings. No attempt has been made to discuss the advantages and disadvantages of the various types of medical treatment, nor the arguments which have been advanced over the years concerning the pros and cons of various operative procedures. Attention has also been focussed principally on the results of treatment, and factors which are considered to have influenced these results.

Before discussing the results of treatment it is of relevance to find out what proportions of patients with peptic ulcer are hospitalised, and of this group, what proportion undergoes operation. Patients who reach hospital constitute only the tip of the iceberg, and arguments have been put forward that those who eventually require operation constitute a special type of ulcer disease, "progressive" or "virulent" (Moore, Peete, Richardson, Erskine, Brooks and Rogers, 1950).

Finer and Fry (1955) noted that in an urban practice of 10,000 patients 177 had confirmed peptic ulcer (132, duodenal ulcer and forty-five, gastric ulcer). Of these, twenty-five per cent had undergone surgery with no bad results. Lipetz (1955) reported on his experience of twenty years in an urban general practice; 4.7 per cent (323) of his patients had peptic ulcer, nearly sixty per cent of whom had not been hospitalised. Forty-five per cent male duodenal ulcer

patients and twenty-three per cent female duodenal ulcer patients had had hospital treatment. Fifty-eight patients (17.9 per cent) had been operated upon, and of these, thirty-four were considered to have satisfactory results. Carroll (1956) considered that good medical management should control between eighty-five and ninety per cent of all peptic ulcer patients and that only ten to fifteen per cent of peptic ulcer patients come to surgery. Though peptic ulcer patients who are hospitalised thus constitute only a small proportion of the total ulcer population, numerically they represent a large problem in the hospital management of patients.

In 1948 almost ten per cent of all hospital beds for adults in England were occupied by ulcer patients, and at out-patient clinics at least ten per cent of the new patients were dyspeptics, the majority of whom were suffering from peptic ulcer (Avery Jones and Pollak, 1948).

Daintree Johnson (1962) analyzed the results of a ten per cent sample of the hospital peptic ulcer population of England and Wales during the years 1956 and 1957. Of patients without haemorrhage or perforation, thirty-seven per cent underwent gastrectomy with a mortality of three per cent, and of the remainder, 1.6 per cent died. The proportion undergoing resection was higher at teaching hospitals (forty-two per cent) than at non-teaching hospitals (thirty-six per cent), and a larger proportion of men than of women had the operation (forty-one per cent and twenty-nine per cent), the differences being greatest for duodenal ulcers. The percentage of patients in each age group who had gastrectomies did not vary much within the range thirty-five to sixty-four

years in regional board hospitals, and thirty-five to seventy-four in teaching hospitals. Outside these ranges the operation was used much less. Unfortunately, in these figures only gastrectomy was considered. Patients subjected to any other operation which did not include resection of the stomach (for example, gastroenterostomy) were not separated from those managed conservatively, though Johnson suggested that these may have constituted only a small proportion.

The most striking effect of advancing years is the enormous increase in the risk to life when complications occur, for example, continued conservative management of chronic peptic ulcer patients after fifty years of age increases rapidly the risk to life. Deaths following gastrectomy also become more frequent in old age though the risks are always well below those which are incurred when a patient is admitted to hospital with an urgent complication. Johnson calculated national estimates in hospital practice from his survey data. He arrived at the conclusion that elective gastrectomy is responsible for only one in seven of peptic ulcer deaths in hospital, and one in eleven of all deaths assigned to peptic ulcer in the Registrar General's annual statistical reviews.

Results of Medical Treatment

Palmer in 1933 formulated the aims of conservative management of peptic ulcer as a) to promote healing, and b) to prevent recurrence. Recurrence rates can, therefore, be taken as an index of success of conservative management.

Results on the whole are disappointing with a high frequency of recurrence; Greenough and Joslin (1899) - forty-seven per cent recurrence rate; Neilsen (1923) - seventy-one per cent recurrence of symptoms within one year, and eighty-seven have recurrence within two years; St. John and Flood (1939) - sixty-five per cent recurrence rate within two years; Ramondi and Collen (1946) - sixty-six per cent recurrence within one year; Flood (1948) - after a seven-year follow-up only twenty-one per cent of duodenal ulcer patients were symptom free, with in the others an average rate of recurrence, once every 2.1 years; Smith (1959) - only twenty-two per cent of patients with duodenal ulcer remained free of symptoms six years after conservative medical care; Smith (1953) of 195 patients with gastric ulcer, seventy-three per cent were symptom free (but his follow-up consisted of ninety-nine patients only); Flood (1955) - in a long term follow-up the majority of patients get a recurrence once every two years; Krause (1963) - eighty per cent of women and eighty-six per cent of men have recurrence of symptoms in a thirty-year follow-up.

It is clear from these studies that, though the rates of recurrence are expressed in different ways, results of medical treatment, once the patient has been admitted to the general hospital, are extremely disappointing, with approximately two-thirds of the patients having recurrence of their symptoms within one year. Most studies have considered peptic ulcer without breakdown into duodenal ulcer and gastric ulcer, but studies of duodenal ulcer alone follow the same pattern. The only study which is concerned with

gastric ulcer alone, and incidently shows the only optimistic result, has traced only fifty per cent of the patients. Krause, who treated men and women separately has shown no difference between the sexes. Only those studies which have had a sufficiently long follow-up have been quoted. Short term results are often better, but studies claiming good results of medical treatment either with no follow-up or one of only a few months are obviously quite unsatisfactory, as many of the patients would not have expected a recurrence of symptoms within that time even without medical treatment (Ivy and Grossman, 1946).

Reasons for recurrences have been sought but a study of the literature does not reveal very definite information about this. Brown (1939) suggested "functional nervousness including fatigue and anxiety" as the greatest detectable cause, while Ivy and Grossman (1946), discussing the problem, concluded that adequate data were lacking and were forced back on the rather vague suggestion that a good, strict dietary regime and a "calm life" might help to prevent recurrences. Flood (1948 and 1955) considered that a slow symptomatic response to medical regime in hospital was a bad prognostic sign. He also considered emotional trauma and feelings of insecurity to be the commonest precipitating factors preceding recurrences, but aetiological significance could not be attributed to these, as they are frequently absent in patients with symptoms of ulcer and present in asymptomatic patients. Similar conclusions were reached by Kirsner and Palmer in a comprehensive review of the ulcer problem in 1952. Krause (1963) in a thirty-year

follow-up of peptic ulcer patients could advance knowledge no further, and Krag (1966), though he discussed symptoms which he considered were bad prognostic signs, for example, a close relationship between mental stress and ulcer dyspepsia, marital and financial difficulties, still could not give definite figures about this. Priestley (1967) considered the problem of intractability and suggested that the patient was intractable, not the ulcer. Circumstantial evidence about anxiety and stress in ulcer recurrence has been provided by studies carried out during the Second World War on the incidence of perforation and recurrence of ulcer dyspepsia.

Thus, on very slim evidence, the consensus of opinion in the literature seems to suggest that psychiatric factors play an important role in recurrence of peptic ulcer.

Surgical Treatment of peptic ulcer

Though it has been estimated that only ten to fifteen per cent of patients with peptic ulcer come to surgery they form an extremely important group. Numerically they account for approximately fifty per cent of 'hospital' ulcer patients, and moreover they present the phenomenon of an attempt to cure a psychosomatic disease by purely physical means. What happens to these patients once their ulcers have been removed?

In essentials, surgery for peptic ulcer consists of two procedures, a) removal of the ulcer and with it a large part of the acid producing portion of the stomach (partial gastrectomy), and the more conservative approach, b) a

drainage procedure with or without accompanying vagotomy to reduce the flow of acid gastric juice. Surgeons have talked of 'tailoring' the operation to the problem on hand (Carroll, 1956; Frankel, Finkelstein and Kark, 1965; Pulvertaft and Visick, 1958, 1952).

General agreement has been reached of the indications for operation. Perforation, haemorrhage, and obstruction with weight loss, all are clear cut complications and the logic of surgical intervention for each is usually a matter of unanimous agreement. The more variable indications will be found among those listed as "intractable", for example, presence of continuing pain or recurrent bouts of ulcer dyspepsia after adequate medical treatment but without any evidence of complications. In these cases the patient, the gastroenterologist, and the surgeon each contribute substantially to the decision for or against surgery (Priestley, 1967; Carroll, 1956).

Discussion of the relative merits of the various operative procedures is deemed outwith the scope of this review, which will be concerned mainly with the results of operation. Evaluation of operation can be approached from two angles, firstly, the physical, and secondly, the psychiatric. These two will be dealt with separately as far as possible, though some overlap is unavoidable.

Physical results of surgery in peptic ulcer

Operation is carried out primarily to relieve the patient of his ulcer symptoms. However, operative intervention can produce new physical symptoms, and in assessment of results,

these must be taken into account. Briefly the most common new physical consequences of operation are (Tanner, 1965):

1. Dumping which was first described by Hertz in 1913, and given its somewhat picturesque name by Mix in 1922. Kellner and Mellinkoff (1962) summarised the clinical features of this syndrome which, though it has rarely been noted in a patient with an organically normal intact stomach (Alvarez, 1949; Levin, 1959) is most frequently found in patients who have been subjected to gastrectomy either total or partial, pyloroplasty, or gastroenterostomy. It consists of one or more of the following symptoms in almost all imaginable combinations and permutations shortly after the ingestion of food, especially sugar; premature satiety or nausea, diarrhoea, hyperhidrosis, tachycardia, weakness or faintness and rarely hypotension. Kellner and Mellinkoff reviewed the literature which provided an abundance of explanations for the dumping syndrome but no single satisfactory physiologic mechanism. Alvarez (1949) felt that the dumping syndrome, with rapid gastric emptying, may occur in hypersensitive, over-reactive, or psychoneurotic individuals.

2. Digestive deficiencies. After partial gastrectomy a minority of patients find they can no longer take milk or eggs with comfort, and sometimes fried food and vegetables are less well tolerated. Deficient absorption of iron and calcium may also occur. Vitamin B₁₂ deficiency is occasionally reported many years after partial gastrectomy.

3. Regurgitation and vomiting of gastric and bilious material occurs due partly to the presence of duodenal juices in the stomach, and partly to the damage to the

phreno-oesophageal ligaments.

4. Hypoglycaemic-like attacks. These occur one to three hours after meals. In some cases a low blood sugar has been demonstrated during the attack.

5. Disturbance of bowel action. This may vary from a more regular action with slightly looser motions, to periodic attacks of urgent watery diarrhoea usually lasting one to two days, greatly disturbing the patient.

6. Vagotomy cramps. A symptom peculiar to vagotomy is mid-abdominal cramp-like pain periodically associated with disordered small bowel peristalsis following division of the coeliac nerve.

7. Cardiospasm. Transitory cardiospasm may occur after vagotomy, partially due to denervation of the parasympathetic supply to the whole oesophagus.

Numerous authors have reviewed the results of operation. While it is difficult to make direct comparisons between some of the studies as their ratings of a successful outcome differ, in the main they agree that a satisfactory outcome of operation is to be expected in approximately eighty per cent of cases; Berg (1930) quoted a recurrence rate of ulcer of 1.1 per cent after partial gastrectomy and thirty-four per cent after gastroenterostomy; Rienhoff (1945) reported that seventy-eight per cent were well, twelve per cent were improved and eight per cent were unimproved; Dragstedt in 1945 and again in 1948 reported a hundred per cent success in the treatment of peptic ulcer patients with vagotomy, although Shanahan (1955), when he reviewed Dragstedt's first twenty-five

treated cases, found that thirty-two per cent were dissatisfied with their operation; Moore, Chapman, Schultz and Jones (1947), reviewing forty vagotomised patients in a short follow-up, found no recurrence in the first two years after surgery; Moore, Peete, Richardson and Erskine (1950) found 28.6 per cent poor results five years after operation; Milstein (1951), reviewing 101 patients eight years after partial gastrectomy, graded 13.3 per cent as having an unsatisfactory outcome; Drablos, Linden and Skuelbred (1951) considered that, of 492 patients with partial gastrectomy five to ten years previously, satisfactory results were present in eighty per cent; Rauch (1952) graded 893 gastrectomised patients ten years later as 26.4 per cent excellent result, sixty-three satisfactory and 10.4 per cent poor; Pulvertaft (1952) showed that 74.7 per cent of his series had 'good' or 'very good' results, 16.3 per cent were satisfactory and nine per cent were failures; Weinstein, Druckerman and Klingenstein (1952) considered that satisfactory results had been obtained in ninety-three per cent of 365 patients with partial gastrectomy; Smith (1959) found that eighty-three per cent of his patients were pleased with the results of their operation six years earlier; Penick and Armstrong (1959) considered that ninety per cent of their patients had a satisfactory outcome; Orr (1962) found that eight per cent fell into the unsatisfactory group; Kemp (1967), using Visick and Pulvertaft's method of grading, found that ninety-three to ninety-four per cent were excellent and two to four were satisfactory, both in long term and short term follow-ups

after partial gastrectomy.

Carroll (1956) summarised the situation thus; of an original group of 1000 peptic ulcer patients about 100-500 will come to surgery. When these surgical patients are evaluated later and the post-gastrectomy group carefully studied, the incidence of disagreeable symptoms is found to vary to some extent with the surgical procedure utilised, the selected patient, and the clinician who tabulates the data. Under the most critical evaluation it may be concluded that about thirty per cent of these patients have merely substituted a new set of complaints for their old ones, with four or five individuals being completely incapacitated, in the sense that they are economically unproductive. A more practical interpretation usually is that ninety per cent of the patients are quite satisfied with their new situation; about five to eight per cent have bothersome complaints, with two or three patients of the original 1000 being real "gastric cripples"; and two patients may be dead.

The most comprehensive review of the results of surgery in this country has come from York. Visick (1948) reviewed 505 gastrectomies carried out by him during the years 1936 to 1947, and Pulvertaft brought this up to date in 1952 and again in 1964. Patients attended a gastric follow-up clinic at six-monthly intervals where they were assessed, and results were graded on a five point scale by a physician and a radiologist, not by the examining surgeon. Information was available on 97.5 per cent of the original group. The overall

ratio of males to females was 6.6/1; the relative proportion of males varied according to the site of the ulcer. For gastric ulcer it was 2:1; duodenal ulcer 9.2:1; and combined gastric and duodenal ulcer 10:1. The overall ratio of duodenal ulcer to gastric ulcer was 3.6:1 (males 4.2:1, females 1.5:1).

Visick (1948) summarised his findings:-

1. Recurrence rate of 3.7 per cent following on two-thirds to three-quarters resection.
2. Operative mortality for the last 430 gastrectomies 3.7 per cent, (duodenal ulcer 2.9 per cent, gastric ulcer 5.4 per cent, stomal ulcer 1/29). If the history was over five years the operative mortality was increased $2\frac{1}{2}$ times.
3. Of the patients examined six months to twelve years after operation, 95.1 per cent showed satisfactory results. (Duodenal ulcer 94.9 per cent, gastric ulcer 98.1 per cent, stomal ulcer 28/31). The year by year continuous follow-up indicates that results improve with time provided the follow-up is intensive; the proportion of patients who are symptom free at six months (forty-seven per cent) rises to sixty-three per cent at forty-two months after operation.

Women were more liable to have minor symptoms resulting from operation; sixty-six per cent of men and only thirty-seven per cent of the women were symptom free. The incidence of failure was 4.5 per cent among men and 7.1 per cent among women.

The highest incidence of failures (8.4 per cent) was in the forty to forty-nine age group. There was one failure in the 119 patients aged over fifty.

Pulvertaft (1952) recorded that, by expressing results as percentages of patients in each grade at six-month intervals, much information was lost, because this method does not give any idea of the individual's reaction to gastrectomy, since it does not indicate whether a patient's grade has remained constant, or varied from period to period. He noted that some patients did vary from grade to grade, and to show individual results, gradings were scored and the overall picture for each patient expressed as a mean grading.

He summarised his results:-

1. Results of operation improved with time (74.7 per cent were good or very good, 16.3 per cent were satisfactory and nine per cent were failures). This was not due to the poor result either dying or being lost.
2. It is doubtful if age has any real effect, but the middle age group (thirty-one to fifty) shows a rather better response than the extremes of age (nought to thirty and fifty-one to seventy).
3. The extent of resection has only a slight effect on the clinical result.
4. In men, the gastric and gastroduodenal ulcers respond slightly better than duodenal ulcers, but the difference is only one of degree. The clinical gradings for recurrent ulcer are less satisfactory

and there is a higher incidence of post prandial symptoms with recurrent ulcers when compared with the others.

5. The results in women are much worse than in men; this is mainly due to an increased incidence of post prandial symptoms, but hypochromic anaemia, particularly in women before the menopause, plays a part.
6. 46.1 per cent of men and 62.8 per cent of women are more than five per cent below their average pre-operative weight. Although it does not hold for individuals, there is a relationship between the degree of loss of weight and the clinical gradings.

In 1964 Pulvertaft brought the survey further up to date. He divided his post-operative period into three: - one to five years, six to ten years, and eleven to fifteen years. Grading of his patients was as in previous studies. Contrary to previous findings he noted that excellent and good grades were diminishing with the passage of time, 76.5 per cent, 68.9 per cent, 67.4 per cent, at each of the five year intervals. Satisfactory grade showed a moderate increase, 15.8 per cent, 23.0 per cent, 23.7 per cent, while the failures remained static, 7.7 per cent, 8.1 per cent, 8.9 per cent.

He turned his attention to the causes of death in patients who had undergone surgery. When gastric ulcer only was considered, 308 resections had been carried out, and he noted high death rates for coronary artery disease (15:13.4),

cardio-vascular lesions (18:13.3) bronchial carcinoma (8:4.2), pulmonary tuberculosis (5:0.9) and suicide (2:0.06). After resection for duodenal ulcer the death rate was much lower and suicide did not figure at all.

Thus the York group has made a major contribution to our knowledge of the physical results of gastrectomy. Whereas other studies have assessed results at an arbitrarily chosen point in time, Pulvertaft has pointed out that physical results of operation vary with length of time after operation, which makes comparisons with the other studies even more difficult. He has also shown a sex difference in the results of operation, but virtually no difference between the groups, duodenal ulcer, gastric ulcer, and gastro-duodenal ulcer. There does seem to be emerging a difference between the ulcer groups in death rates after operation, with gastric ulcer carrying a higher mortality and in addition the possibility of an increased suicide rate, which has not appeared after operation for duodenal ulcer.

Other studies have tended to confirm Visick's initial finding that results improve with time. Allen and Welch (1942) in their follow-up suggested that complications appear in the first two years, and Rauch (1952) stated quite categorically that results improved as the years went on without, however, giving any figures to back this up.

A similar sex difference in outcome to that of Pulvertaft's was found by Penick and Armstrong (1959) who examined the results of partial gastrectomy in 449 patients between three to twelve years after operation. For the males of the group with a radical gastrectomy ninety-four per cent were rated

as having a satisfactory outcome, while with a smaller gastrectomy 85.4 per cent were satisfactory. For the females the figures were 82.5 per cent and 71.4 per cent.

Krause (1963) observed long term results (thirty to forty years) in two groups of patients, a) treated medically, and b) treated surgically. In the medically treated group, he noted that three male duodenal ulcer patients had committed suicide where the expected incidence was 2.7 for the whole group, and 2.4 for males only. Of 323 operated cases thirteen had committed suicide where the expected figure was 1.9. On further examination he found that this involved both men and women, both types of ulcer, and that the actual difference in procedure at operation had had no effect. He postulated that, therefore, this increased incidence must be the result of the operation and tentatively suggested that this might be due to increase in post prandial symptoms and/or anaemia. Even more tentatively he suggested that more patients with personality disorder might be found in the operated group though he had no real evidence of this.

Factors influencing the outcome of surgery.

Much has been written about the various factors which contribute to success or failure in operation. Investigators have used different approaches. For example, Thoroughman (1960) looked at the problem from the point of view of indications for operation. He graded indications and then considered the outcome of surgery in each grading; pyloric obstruction - ninety-five per cent good results; acute massive haemorrhage and repeated bleeding - ninety-six per

cent good results; two or more previous perforations - one hundred per cent good results; intractable ulcers - fifty-nine per cent good results.

Other investigators have discussed failures of operation from the point of view of incidence of post-gastrectomy syndromes. Texter and Moeller (1956) reviewed the literature, and suggested that an incidence of four to ten per cent severe dumping and twenty to forty per cent moderate dumping was to be expected. Late post-prandial symptoms (hypoglycaemic-like attacks) occur in three to ten per cent of patients. Many reasons have been put forward in explanation of these symptoms, but no single physiological cause has emerged. Almost without exception surgeons and gastro-enterologists alike have noted that psychological factors were of importance, and from discussion of post-gastrectomy problems they have generalised to the suggestion that the personality of the patient was of importance in the selection for operation.

Alvarez, as early as 1944, in his discussion on treatment of peptic ulcer declared that there is "a percentage of patients with ulcer who are decidedly worse off after an operation and perhaps ruined for life by it", and furthermore "there is a certain number of persons with ulcer who do not stay cured after any type of operation. What is terribly needed today is some way of recognising them before operation or better yet some medical treatment much better than any we physicians have at our disposal".

In his analysis of eight per cent of patients unimproved after operation, Rienhoff (1955) claimed that "all of these patients were of a sensitive, highly strung type in which

there was a pronounced degree of psychobiologic lability". Adlersberg and Hammerschlag (1947) noted that the final picture in patients with severe post-gastrectomy syndrome was very similar to that of anorexia nervosa, while Schechter and Necheles (1948) in a full review of the aetiology of dumping included nervous and psychic factors. In 1953, following an analysis of the failure rate in 394 resected patients, Harvey, St. John and Volk regarded the major difficulty after surgery as disturbance of digestive function including failure to gain weight. They considered that this was most likely to occur in people who seemed before operation to be psychologically handicapped, but argued rather oddly against a pre-operative assessment of psychogenic factors, as "this might influence the decision to operate". They examined the charts of their patients, and noted that forty-four per cent were considered nervous pre-operatively (thirty-eight per cent mildly and six per cent severely). Bad results occurred twice as often in the mildly nervous group, and three times as often in the severe group, when compared with the others. Pulvertaft (1952) noted that severity of dumping in some cases varied considerably with time, and that these constituted a separate group of "dumpers" in whom it was possible to relate the periods of exacerbation with times of physical and mental stress. Though he felt that the basis of the syndrome was physiological, incidence and severity were considered by him to be influenced by psychoneurotic factors. That the psychologically 'bad risk' patient will develop

dumping symptoms post-operatively was the view advanced by Texter and Moeller (1956), who went on to discuss post-operative psychiatric illness in general. They did not think that difficulties after operation were specific to partial gastrectomy, but that any operation would bring psychiatric troubles as an aftermath in these patients. Machella (1961) considered that in some of the patients emotional problems were aetiologically important pre-operatively, and that this group would after operation develop post-gastrectomy symptoms. The situation in the light of present knowledge was summarised by Kellner and Mellinkoff (1963):- "dumping syndrome represents a complex and variable mixture of physiologic disorders, which tend to ensue when the normal gastric emptying mechanisms are surgically altered, but most patients adapt themselves to the new situation. In non-adaptors, although a variety of physiologic and biochemical observations has been made, the central cause of failure is usually emotional, and therapy should be directed toward motivation of the patient".

In a few studies surgeons have looked at neurotic illness in the operative group as a whole, rather than single out the failures. Muir (1949) examined 124 patients who had had partial gastrectomy, although only ninety-nine had been carried out for peptic ulcer. He considered that a high incidence of neurotic symptoms occurred after gastrectomy - six patients had anxiety symptoms, ten had neurotic vomiting, and a further five were neurotic air swallowers. He considered that indifferent functional results of

gastrectomy were directly due to psychological causes, and these patients were unable to readjust to the new conditions obtaining after operation. Early convalescence behaviour was stressed by Milstein (1951) as being of prognostic importance; the more stable patients return to work as soon as possible. He added the cautionary note that all patients with residual symptoms are not neurotic, but that in a few cases marked disparity exists between the symptoms and the disability. Drablos, Linden and Skuelbred (1951) found an incidence of neurotic illness of 21.4 per cent in their operated group (in men, 3.2. per cent marked and 11.5 per cent less marked, and in women, 25.7 per cent marked and 34.3 per cent less marked). They compared their findings with that of Ruesch:- "Eighty per cent neurotic illness in a non-operated group of duodenal ulcer patients" - and concluded that operation by removal of the ulcer, had improved neurotic illness.

The question of patients' adjustment after operation was the subject of an article by Roth, Cogbill and Onufrock (1959). They examined 100 unselected males, twelve of whom had had elective surgery for gastric ulcer. The group as a whole worked more regularly after operation, though twenty-one did no work or did no steady work post-operatively. The majority of these, however, had had poor work records before operation. One third of the group took lower paid jobs. Fatigue and weakness were the most important complaints, and dumping symptoms per se were not a common cause of disability (present in fifty patients but severe

in only three). Twenty-one patients presented new symptoms after operation. Of thirteen noted to be alcoholics pre-operatively, four stopped and two increased their drinking after operation. Six more patients started drinking heavily. These investigators concluded "some psychiatrists have hypothesized that the relief of peptic ulcer symptoms by surgery may result in development of new symptoms as an outlet for emotional tension some patients did but usually seemed to have organic basis".

In a discussion on the position reached in duodenal ulcer today, Pops, Bachrach, Barker, Cooke, McDonnel, Mellinkoff, Rimer and Soghor (1967) concluded that the patient's personality is an important consideration in weighing the indications and contraindications for surgery. They stressed the proper selection of patients, with the rider that neurotic patients do not necessarily have poor operation results.

Discussion of findings of physical results of surgery, and factors which influence operative outcome.

Thus, having considered physical results of operation for peptic ulcer, it is clear that no one operation is the answer. Each operation has its drawbacks, the more conservative with higher risk of recurrent ulcer and the more radical with its sequelae of new symptoms. General agreement has been reached both on the indications for operation, and the proportion of patients who will require operation. Numerous studies have documented the kind of symptoms to be expected after operation, and how various factors such as age and site of ulcer, indications for surgery and time since operation

influence the results.

The literature is much less helpful and more contradictory when it looks for aetiological factors of poor outcome of surgery. Many of the studies can be criticised; for example, the same investigator who knows the physical outcome searches in the notes for psychiatric symptomatology; analysis of failures gives no indication of the size of the original surgical sample; most assessments of psychiatric disability are made after operation in the failed patient, and it is assumed that such psychiatric symptoms are the cause and not the result of failure; little or no assessment has been made of the patients pre-operative symptomatology; terms describing the psychiatric symptoms of the patients are imprecise, vague, and others have no real meaning clinically (for example, psychobiologic lability). Agreement has, however, been reached on some points:-

- 1) The personality of the patient plays some part as yet largely unknown in the outcome of surgery.
- 2) At least two investigations have raised the possibility of increased suicide after operation.
- 3) While patients seem to work more steadily after operation the suggestion has been made that they accept less good jobs.
- 4) The suggestion has been made that alcoholism after gastrectomy might be increased.

Psychiatric Contributions to the Medical Treatment of Peptic Ulcer

Division into psychiatric treatment and physical treatment is largely artificial. As can be seen from the

preceding section physicians and surgeons have devoted much attention to psychiatric factors influencing the outcome of surgery, especially in recent years when, after the first flush of enthusiasm, it became obvious that removal of the ulcer did not invariably lead to the perfect result.

Before considering psychiatric contributions to the surgical treatment of peptic ulcer, it is relevant to note, firstly, whether any investigation has been carried out on the effect of psychiatric treatment on the non-operated patient.

In their pioneer work in the field of personality and peptic ulcers analytic workers stressed the importance of analysis in treatment and claimed good results. It has been shown, however, that their number of treated patients was small, and follow-up studies were not carried out, so that no conclusions of the efficacy of this form of treatment could be drawn. Kaufman (1918) stressed the importance of the psychic element in treatment but gave no details of any such treatment carried out, and most investigators have been content to go no further (Saul, 1946; Eustermann, 1947; Kirsner and Palmer, 1952), until Selesnick in 1952 attempted to see whether psychotherapy was indeed a valuable adjunct in the treatment of ulcers. He divided sixty chronic male duodenal ulcer patients in hospital into two groups, giving one group psychotherapy and the other an ordinary dietary medical regime of treatment. He concluded that the former group did at least as well, and possibly were discharged from hospital sooner, but his findings were very tentative. Unfortunately no follow-up study of the two groups was

carried out. Da Silva (1957) discussed different methods of treating peptic ulcer and showed that successes are almost the same whatever the medical treatment. He claimed that success in operation depended less on the techniques of the operation itself, and more on the psychological aura of care surrounding the operation. He limited himself to these observations and gave no data upon which he based his conclusions. Thus apart from suggestions about the importance of psychiatric treatment and one study in an attempt to evaluate it, psychiatrists have in fact not followed up their work on personality and emotional factors in aetiology of peptic ulcer with any major contribution to the medical treatment of the disease.

Psychiatric Investigation concerned with Surgical Treatment of Peptic Ulcer

Surgical removal of peptic ulcer is, in essentials, a physical method of treating a psychosomatic disease. As such, this form of treatment and the sequelae of operation have presented a challenge to the psychiatrist, and since 1948 the knowledge of the psychiatric effect on the patient of operation has been increasing. The literature on the subject has followed two main trends, a) what happens to the patient after operation, and b) can the knowledge gained be useful in predicting operative success or failure.

Szasz (1948, 1949, 1952) conducted a series of follow-up studies of ulcer patients who had been treated by Dragstedt by means of vagotomy. He was much influenced by Alexander's theory of the aetiology of peptic ulcer, and

considered that prognosis after surgery depends to a large degree whether or not the illness has been invested with psychic energy. The greater the investment, the greater the economic role of illness to the patient, and these factors carried the worse prognosis. He also presented some findings which suggested that removal of the ulcer symptoms may be followed by development of other symptoms. The number of patients considered was small (at the most twenty-five), and criticism can be made that his series was not selected at random, but contained a disproportionate number of unfavourable results. In addition, none of his patients had been examined psychiatrically before operation.

Dragstedt's first twenty-five cases treated by vagotomy were re-examined in 1955 by Shanahan. Data was available on twenty- sixty-four per cent of the group (all men) were considered to be surgical successes, and their personalities were described as conscientious, hard working, ambitious, moderately or very successful. Forty-four per cent of the successful group had had other psychosomatic illnesses before operation, and had not changed materially in this respect. Thirty-two per cent were dissatisfied with their operations, and only one of this group was working. Of this group six had had psychosomatic disease before surgery. From this data the investigator constructed personality profiles of the predicted good and bad results of surgery. He predicted a good result in a good, steady, conscientious man, with long-standing successful reaction formation against dependency. He would expect him (the patient) to have made a stable marriage with a supportive wife. A bad

result was to be expected in a woman forced against her wishes to be self-supporting, or a man who openly accepted dependent inclinations before surgery. It would seem that his conclusions were too sweeping to be supported by the actual data given, and based on a very selected small group of patients.

Browning and Houseworth (1953) took up the question raised by Szasz of the development of new symptoms following operation. They examined thirty male duodenal ulcer veterans who had undergone gastrectomy for relief of ulcer dyspepsia at least a year previously and utilised as a control group thirty male duodenal ulcer veterans undergoing medical treatment for their ulcers. Information was obtained from interviews by a psychiatrist and by a social worker. They found that the surgically treated group had a significant decrease in ulcer symptoms following gastrectomy, but there was a concomitant increase in other psychosomatic and psychoneurotic disorders. In fact the incidence of psychosomatic symptoms in the surgically treated group was said to increase from thirteen to thirty-seven per cent, and the incidence of psychoneurotic symptoms from fifty to one hundred per cent. At follow-up twelve to eighteen months later, the medically treated group still had their ulcer symptoms but had developed few new ones, while still more of the gastrectomy group were complaining of new symptoms. None of the latter group had been studied pre-operatively, so that the incidence of symptomatology at that time was completely retrospective, with all the inherent difficulties that such a method of gaining information

entails. Furthermore, the study came from a Veterans Administration Hospital, as practically all the American studies in this field have done. Thus the population entering the hospital was a selected one being all male, and all veterans. No work has been done on the influence of war service in such patients, nor how pension rights fit into the picture. Have the patients a vested interest in producing new symptoms after definitive surgery for peptic ulceration?

The same question of new symptomatology after operation was investigated by Badal, Driscoll and Maultsby (1956). They widened the concept a little to see whether symptomatic changes followed not only surgical treatment, but whether any loss, however induced, of ulcer symptoms would be followed by the appearance of other symptoms. To this end they investigated thirty patients hospitalised for peptic ulcer, half treated medically and half treated surgically by subtotal gastrectomy. They were examined by a standard interview at least one year after the onset of treatment with the aim of ascertaining psychoneurotic, psychosomatic and behavioural symptoms, before and after hospital treatment. Twenty-one out of the thirty patients showed changes, some profound and some very subtle ranging from acute hysterical reactions to chronic neurotic invalidism. Unfocussed anxiety occurred in some, and some acquired other psychosomatic disease. The specific changes seemed to depend more on the individual's basic conflict, and the way in which he had worked the symptoms into his pattern of defence, rather than on the specific type of medical or

surgical treatment, though dramatic neurotic breakdowns seemed to occur mainly after surgery. The investigators considered that treatment outcome could be predicted only if this basic dynamic unit was known. Again the pre-operative and pre-treatment assessment of the patients was retrospective. In addition no information is given how the patient groups were selected. By inference it seems that after treatment they had been rehospitalised, or referred formally to the psychiatrist. No information is given about the physical outcome of treatment, and it is not known whether the investigation was thus concerned with a group of surgical and medical failures or a mixture of the two, that is, what the groups examined really represented.

Ely and Johnston (1966) focussed attention on the same problem of new symptomatology after operation, but set up a prospective study. Patients entering the surgical and medical services of the Seattle Veterans Administration Hospital and the University of Washington Hospital were examined before treatment by psychiatric interview, and in addition completed a Cornell Medical Index and a Minnesota Multiphasic Personality Inventory. They were then examined at approximately yearly intervals up to four years. Fifteen patients had a gastrectomy and fifteen were treated medically. Results showed that eighty per cent of the medically treated group had recurrence of ulcer symptoms, and only three patients developed new symptoms. At follow-up none of the gastrectomy group complained of ulcer

symptoms, but eighty-seven had new symptoms; chest and back pain (two patients); abdominal cramps (two); easy fatiguability (five); weight loss (two); and assorted other complaints such as decreased stamina, diarrhoea, dizzy spells not related to meals, and neck and back pain.

The data from the Cornell Medical Index indicated that the complaints of the medical group remained fairly stable. The gastrectomy group initially had a decrease in complaints in regard to the gastro-intestinal items, which subsequently tended to return to the original level. Complaints in other areas of a psychoneurotic and psychophysiological nature tended to increase in the gastrectomy patients.

The M.M.P.I. data tended to indicate greater change in the gastrectomy group both in the direction toward more psychopathology, and in the direction toward less psychopathology, than any change noticed in the medical group which tended to remain fairly stable. The M.M.P.I. profiles of the gastrectomy group tended to move back to the original pre-operative M.M.P.I. profile in subsequent years.

The investigators concluded that gastrectomy, with its relief of ulcer symptoms, was instrumental in pushing these new symptoms into significance. Surgical treatment of the ulcer, without treatment of the underlying anxieties and conflicts, tends to result in the development of new symptoms, which replace the functional role served by the ulcer symptoms in the maintenance of psychodynamic homeostasis.

This much more carefully controlled and prospective study,

therefore, has findings in agreement with earlier work on this subject. Unfortunately there is no information on the physical results of treatment, and the groups are treated as a whole, so that individual reactions to treatment with any change over the time span of follow-up are not recorded. In addition, the investigation was carried out on a very selected group of patients under sixty years of age and with no other major physical disability. Initially forty-two subjects were interviewed but follow-up data was available only on thirty-four. Of this group two were discarded (women) and a further two because they had a different surgical procedure (pyloroplasty and vagotomy).

The contrary view was taken by Weinberg (1937) who investigated the emotional behaviour of sixteen ulcer patients (the majority male) by a psychiatric interview carried out sometimes pre-operatively and always post-operatively. He showed improvement of emotional behaviour after operation in eleven patients in a follow-up of one to five years.

Sanamjan in Moscow (1956) looked at the problem of gastrectomy in the laboratory. He found disturbances of vegetative functions in sixty-four patients whose stomachs had been resected one to ten years previously, and compared his findings with ten patients with gastric ulcers. Thirty-six patients of the first group showed vegetative disturbances compared with seven of the second group. He concluded, therefore, that vegetative disturbances arise prior to gastrectomy.

Other investigators have compared surgical failures with surgical successes, to see if it is possible to differentiate between these patients. Weiner (1955), using the M.M.P.I. as a tool, found that the personality differences between successful and unsuccessful gastrectomy patients (Twenty patients in each group) in regard to dumping were of such a nature that individual M.M.P.I. profiles could be correctly sorted as to surgical results in 87.5 per cent of the cases. Individuals with unsatisfactory operative results also exhibited significantly more manifest anxiety. He believed that M.M.P.I. profiles could be used as a simple objective additional aid in the assessment of suitable gastrectomy patients, and furthermore, when feasible, psychoneurotic candidates for gastric resection might be treated psychotherapeutically rather than surgically. Though physical and psychiatric assessment was carried out by independent investigators the study is limited in its usefulness, in that it cannot disentangle cause and effect of psychoneurotic symptoms in the failure group. Weiner himself was conscious of this, and set up a control group of fourteen patients to whom the M.M.P.I. was administered pre-operatively, and repeated from ten days to six weeks post-operatively. Test-retest correlations for the individual scales were slightly higher than those reported by the test authors in the revised manual. He concluded, therefore, that resection had not affected responses in the personality inventory very much, and that similar results would have been obtained from his main study if pre-operative data had been used. But he has only partially succeeded in overcoming the difficulty of

generalising from a single post-operative testing. All patients were retested before discharge from hospital, that is, before they had started on their normal life again with its possible environmental stresses and strains. A fairer control would have necessitated a longer time interval between test and re-test.

Rond (1959) discussed fifty post-gastrectomy patients evaluated from a psychiatric viewpoint, and concluded that the post-operative course was dependent upon two factors; the personality dynamics of the patient and the importance of the ulcer as an operant stress factor. If the ulcer is the primary stress factor in a stable personality, its removal leads to excellent results post-operatively. If, however, the ulcer is associated with an emotionally unstable personality, Rond expects nothing but poor results from surgery. Again in this study no pre-operative assessment was carried out.

The Bender-Gestalt Test was used by Lothrop (1958) to compare nine white male veterans, who had successfully managed their symptoms over a period of years, with nine patients who were medically intractable and for whom surgery was foreseen. The raw scores did not overlap. A significant difference was also found when he compared those of the nine who responded well to surgery, and those who had recurrence of symptoms after surgery. Lothrop, therefore, concluded that there was a difference in the surgical group compared with the medical group, and a further division in the operative outcome groups, and suggested that the Bender-Gestalt test was an effective

instrument in assessing prognosis. His numbers used, however, were too small to make very definite conclusions possible from his findings.

Leonard, Papermaster and Wangenstein (1957), on the basis of evidence suggesting the presence of a concomitant important psychogenic overlay in post-gastrectomy syndromes, attempted to treat six patients severely incapacitated by dumping by hypnotic suggestion. The initial session lasted twenty to thirty minutes each. The investigators noted considerable improvement and return to work in each case, and added the fact that since the preparation of their article, a total of sixteen patients had obtained relief by this method of treatment. Unfortunately, however, they gave no follow-up data on their group.

The association between indications for operation and physical success of outcome has been noted by Thoroughman. In male veterans with duodenal ulcer, failures of surgery were found in those operated on for intractability. In a series of articles Pascal, Thoroughman and Jenkins (1963, 1964, 1964, 1966, 1967, 1967) have outlined their views that surgical success or failure in patients with intractable duodenal ulcer may be predicted on the basis of certain psychological and environmental variables. They advocate the use of what they call their deprivation scale, state that cut-off scores are given for predicting surgical outcome, and that when these cut-off scores are used the scale has a high predictive value. Failure of surgical treatment is marked in patients with a poor score on such factors as

employment, income, debts, job status and relationships with family, friends and the community. This method was used about the time of operation for intractable duodenal ulcer in forty-seven male patients, and the surgical outcome was evaluated two years later. No failures occurred in the twenty-one patients with good scores, compared with failures in six of ten with middle range scores, and in fourteen of sixteen with low scores.

In another study of sixty-nine similar patients, a high correlation was apparent between surgical outcome and Bender-Gestalt test scores. The patients with intractable ulcer, who responded poorly to surgery, were similar to psychiatric patients as studied by this test. In twenty-nine with Bender-Gestalt scores above the mean, surgery failed in twenty-one compared with only nine surgical failures in forty with scores below the mean.

In a third study ten patients with a poor surgical outcome were matched with ten with a good outcome, and questioned about memories of specific incidents involving the patient and his parents in various situations during the first ten years of his life. The patients with good surgical outcome reported memories indicating that parental behaviour, particularly of the mother, was more normal than the behaviour of the parents of patients with poor outcomes. Maternal affection appeared particularly important, and was tested in forty-six additional patients, twenty-four with surgical successes and twenty-two with failures. A significant correlation was found between surgical failure and absence of memory of affection.

In a fourth study in the series, deprivation scale and memory interviews were obtained from twenty patients with poor surgical results for duodenal ulcer and twenty patients without ulcer who were coping inadequately with their chronic disease. The groups were undistinguishable, leading the investigators to the conclusion that there is nothing specific about intractable ulcers. They all belong to a much larger population of behavioural deviants. Both these groups were significantly different from matched patients with good surgical results for duodenal ulcer.

Cumulative evidence from this series of studies thus seems to reinforce the significance of psychogenesis as a component in many diseases, and a specific correlation appears likely between psychological factors and reaction to a physical disorder. In addition intractability appears likelier in patients with unsatisfactory environments and whose early relations with parents were poor.

This long series of studies has, therefore, stressed that the personality of the patients and environmental variables affect surgical success. All patients concerned were male with duodenal ulcers, veterans, and only those operated on for intractability were considered. Before generalisation to all peptic ulcers could occur, the scales would require validation with other populations, and for all operations whatever the indication.

Only one study of Britain has been directly concerned with the incidence of psychiatric illness following surgery for peptic ulcer, that of Sinclair-Gieben, Clark and Dean (1962) from Aberdeen. The operation concerned was simple

closure of perforation, that is, not a definitive measure for cure of ulceration, and performed under emergency, not elective conditions. On the basis of three questions, forty-three per cent of a group of 118 patients were classified as obsessional. In the obsessional group there was a high incidence of psychiatric symptoms when operation relieved the chronic ulcer symptoms. The psychiatric symptoms were mainly of a depressive type, and included cases of attempted suicide. Criticism can be made of thus classifying patients on the basis of their answers to three questions. In addition, observer bias was not eliminated in this study, as the same person assessed the obsessional personality and the psychiatric illness on the basis of an interview. Furthermore the study was retrospective.

From Canada, Johnstone, Holubitisky and Debas (1967) discussed seven patients with personality defects, who out of a series of 130 patients had had a disastrous outcome of surgery. Operative indication in all cases was intractability, and from their persistent attendance at the gastrointestinal clinic they became known as the "Albatross Syndrome". Personality defects were present before operation, and from the description of the case histories it was obvious that poor selection of cases for operation was an important factor in this study, only two out of the seven having confirmed peptic ulcer disease.

Alcoholism and Gastrectomy

Studies on the association between peptic ulceration and alcoholism have been discussed in a previous section.

Høger-Pedersen (1959), in a study of male duodenal ulcer patients admitted to a psychiatric ward, commented that a significantly high proportion had had gastrectomy, and that alcoholism was the primary reason for psychiatric admission.

Lereboullet, Pluvinage and Jungers (1955) noted that partial gastrectomy for duodenal ulcer was four times as frequent among alcoholics as among non-alcoholics. In about half these cases the addiction started between three months and five years after operation. Martimor, Dereux and Nicholas-Charles (1956) found partial gastrectomy four times more common among hospitalised alcoholics than among those suffering from other mental disorders. Delore and Chaupy (1956) observed thirteen men requiring treatment for alcoholism after partial gastrectomy, but felt the association was a chance one. Levrat, Pasquier and Pasquier (1958) comment on the bad operational risks where alcoholism and peptic ulcer coincide. Navratil and Wenger (1955) found that 24.5 per cent of 200 male alcoholics had a peptic ulcer, and that nineteen per cent had a partial gastrectomy, and Soeder (1957) suggested that there is a special tendency for gastrectomised patients to develop alcoholism.

Dick, Fischer and Sautter (1959) reviewed the literature and commented that the incidence of post-operative alcoholism had varied from five per cent to seventy per cent. Navratil in a further paper (1959) criticized these investigations, and went on to summarise the findings of 500 patients with alcoholism of whom 103 became so afflicted after partial gastrectomy.

Whitlock (1961) examined twenty-five patients (seventeen men and eight women) who were admitted for psychiatric treatment to Newcastle General Hospital after a partial gastrectomy. Fifty-six per cent were admitted for treatment of alcoholism or drug addiction.

The literature, therefore, points to the evidence that there is some relationship between alcoholism and partial gastrectomy. Some writers have claimed a causal relationship, quoting the very high number of their alcoholic patients who have had a partial gastrectomy. This is far from being proved as these writers are dealing with a highly selected population. They have no idea of the size of the gastrectomised population that these patients come from, and other writers have pointed out that heavy drinking in some cases not only preceded the operation, but preceded the development of peptic ulcer symptoms. Follow-up studies of patients after gastrectomy have not unduly stressed the problem of alcoholism.

Summary of Psychiatric Investigation in the Surgical Treatment of Peptic Ulcer

Results of psychiatric investigation into the surgical treatment of peptic ulcer have emphasized the importance of the personality of the patient and emotional disturbance present before operation in the outcome of surgery.

While many of the studies can be criticised on the basis that they are retrospective, findings in them, and in the very few prospective studies, are roughly comparable.

The more "psychiatric trouble" detectable before

operation, the more likely is the operative outcome to be poor. As a logical extension of this, various authors have tried to predict operative outcome in the individual patient, and have indicated tests which might be helpful in this context. Thoroughman has advocated the use of his Deprivation Scale, and other workers have suggested the use of either the M.M.P.I. or Bender-Gestalt Test.

Unfortunately, practically all the work in this field has come from America, and in particular has been confined to the study of male white duodenal ulcer veterans. As it has been shown by Pulvertaft that there is a sex difference in outcome, generalisation from these studies to peptic ulcer as a whole is not possible. There has been no comparable British study.

The position of alcoholism and gastrectomy is not clear, but that some association is present is generally agreed.

Psychiatric Consequences of other Operations

Are, however, the ulcers unique in these psychiatric consequences of operation? The literature was examined to see if other operations brought distressing sequelae in their wake, and if the personality of the patients undergoing surgery was considered to have an important bearing on this. In no sense is this section intended to be an exhaustive review of this subject.

As early as 1934 Menninger, in an article on polysurgery and polysurgical addiction, stated "Painful surgery may be accepted as an attempt to avoid an even worse experience may be welcomed as a punishment". Fox (1954) interviewed

thirty-eight patients with mitral stenosis both pre- and post-operatively. He concluded that understanding of long term adaptation to progressive limitation of activities provided the background necessary for the recognition of emergency defences as they develop in the hospital situation. He discussed the types of defences and their adequacy which he encountered in his group of patients, but made no attempt to predict surgical success or failure.

All patients undergoing surgery performed the House-Tree-Person Drawing Test before and after surgery in a study by Meyer, Brown and Levine (1955). They noted differences in the two drawings and concluded that before operation there were multiple indications of psychologic regression, which disappeared after operation. This they concluded was a response to anxiety or to a sense of imminent catastrophe.

Gottschalk (1957), in a discussion following Badal, quoted two studies:-

- 1) Kaplan investigated shifts in reaction patterns in eighteen cardiac patients following removal by operation of chronic symptoms. Sixteen months after operation sixty-six showed new symptoms and disturbances, some of which interfered with total rehabilitation.
- 2) A representative sample (200 patients) of one year's admissions to surgical wards in a Cincinnati hospital were examined. Shifts in psychiatric adaptational patterns occurred in thirty-five per cent of patients with operation, and in forty per cent of those who did not have an operation. It was considered that shifts occurred more often in patients with worse states both surgically and psychiatrically when they

were assessed three to six months after hospitalisation. The severity of the operative procedure was of no significance. Gottschalk postulated that there might possibly be a unified theory of sickness behaviour, especially if the interpersonal functioning of the patient was involved.

Menzer, Morris, Gates, Robey, Plant and Sturgis (1957) studied twenty-six patients who had undergone hysterectomy. They concluded that the immediate post-operative recovery state was a significant herald of subsequent reactions which depended on the patient's character structure, the nature of anxieties, ego defences, strength of the ego and the feelings and fantasies aroused by the hysterectomy.

In a long discussion of the psychiatric aspects of surgery, Garner (1959) stated that surgery was a stress situation, and concluded that reactions to the traumatic experience of surgery are determined by the previous personality state of the patient, and the relationship of the current stressful situation to patterns of previous traumatic conditions. Similar conclusions were reached by Hackett and Weisman (1960), who further stressed the importance of planned therapeutic consultations with the patient to help minimize the psychological obstacles to recovery.

Weiss (1966) studied thirty open heart surgery patients before operation, and compared them with a control group of twenty-four patients about to undergo major surgery, using the Cornell Medical Index and the M.M.P.I. They were evaluated again three to seven months post-operatively.

Almost half (fourteen) of the heart surgery patients

experienced an acute post-operative reaction suggestive of an acute psychotic episode. Analysis of psychological test variables suggested that the more deviant profiles of the 'reactor' group were the result of a diffuse stress reaction, which was not reflected in the profiles of the 'non-reactor' group. A preliminary investigation into the construction of a prediction equation was one hundred per cent successful in differentiating fourteen reactors from sixteen non-reactors, on the basis of twenty-five pre-operative psychological variables. Conclusions pointed to the importance of evaluating the psychological resources of the patients in such life-threatening situations as open heart surgery, for example, into the dependence of functional and organic factors in the assessment of disease.

Similar conclusions were reached by Hazan (1966) when he reviewed the literature on open heart surgery. Though he was concerned with short-term psychiatric disturbances only, he noted that their incidence was greater in patients with a) unreal expectations of surgery, b) those using denial as a major defence mechanism and c) those with a high level of pre-operative anxiety.

Burgess, Kirklin and Steinhilber (1967) studied thirty-six patients undergoing open heart surgery. Acute pre-operative anxiety was present in all, and three had clinical depressions. They were seen again ten to sixteen months after operation and psychological adjustment compared with physical outcome. Scrutiny of their medical records for mention of emotional disturbance showed that forty-six per cent with poor results had adverse pre-operative comments.

Much of the investigation in open heart surgery patients has tended to show similar findings to those of post-operative peptic ulcer patients. In particular, personality problems and anxiety noted pre-operatively have been associated with a poor outcome of surgery.

The concept of the sick role, and the patient's reaction to it, has emerged as a unified theory. No matter what chronic disease the patient suffers from, prospects of cure by surgery will depend on the patient's personality and the part played by his illness in his total life pattern.

FINDINGS FROM THIS STUDY OF THE LITERATURE OF PEPTIC ULCERATION

Study of the literature shows that a great deal of work has been done in connection with the disease, what causes it, what influences the clinical course when it is chronic and relapsing, and when definite cure by surgery is attempted, what influences the outcome.

Many theories of causation have been advanced, and enthusiastic work carried out in support of each theory but it is obvious that no single hypothesis will cover all the factors involved. In fact the literature on causal factors in peptic ulcer has become "bogged down". The role of psychological factors in the aetiology of the disease is undisputed, but no evidence has been advanced to prove that they are the sole causal agents. Not all patients with personality problems develop peptic ulcers, and such problems are not present in all ulcer patients. In addition, how the ulcer develops and, in particular, becomes chronic, is not known. Possible pathways from the hypothalamus and via the pituitary-adrenal axis have been mapped out, but the actual development of a peptic ulcer in the stomach or duodenum is not clearly understood.

That anxiety and stress obviously play an important role in recurrence, is the general consensus of opinion, but how they do so is not clear.

The proportion of patients with peptic ulcer who will require hospitalisation is known, and the various factors, both inherent in the disease and in a social context, that influence their admission are recognised. But little is definitely known about the extent and type of psychiatric

disturbance that is present in these patients.

General agreement has been reached on which patients will require operation, with little doubt when complications are present, but with room for individual variations when the indication for operation is intractability of the ulcer.

Physical follow-up after operation has documented clearly the results to be expected and findings from the various studies are comparable. The ground is much less firm when reasons are sought for a poor surgical outcome other than the obvious failures of technique, though again the role of psychogenic factors clearly bulks large. Surprisingly no follow-up study has been carried out in which the relationship between physical and psychiatric results of operation has been considered. It would seem obvious that in a psychosomatic disease such as peptic ulcer (within the definition given previously) possible relationships between the two 'sets' of symptoms would be of importance. The bulk of the work in connection with psychiatric factors and operative outcome has come from America, and in particular from a selected population of American 'hospital' ulcers.

That these problems, at one time thought to be specific to peptic ulcer, have now to be considered within the much wider framework of illness and illness behaviour is evident from comparable work carried out on other illnesses. Incidence of neurotic illness is high in other patients referred to general hospitals.

Possibly the suggestion of likeness between the ulcer population and other sick populations is the most fascinating

trend to emerge from this study of the literature, and by concentrating on unravelling the threads which make up the sick role, and the patient's reaction to his organic illness, more light will be thrown on the aetiology and course of peptic ulcer.

CHAPTER 3

MATERIAL AND METHODS

(Material and the table relevant to this chapter comprise Appendix III)

MATERIAL AND METHODS

Object of the Investigation

To examine the hypothesis that certain psychological and personality factors are predictive of outcome of surgical and medical treatment for peptic ulceration, and that psychiatric and physical progress after treatment are associated.

Aim of the Investigation

To examine medical, social, and psychological attributes in a group of patients, suffering from chronic peptic ulceration, who have been referred to hospital to see which factors can be considered predictive of or associated with differentials in outcome of treatment.

In order to do this it was considered a necessary preliminary step to examine these patients before treatment began (the initial interview) to establish a baseline with which to compare the subsequent progress of the group (the follow-up). Treatment of ulcer patients after referral to hospital falls into two major categories, a) medical and b) surgical. The aim of the present investigation was the comparison between the two groups with respect to outcome of treatment, and examination of the relationship between physical and psychiatric outcome in each treatment group.

Summary of the Investigation

One hundred and seventy-eight patients suffering from chronic ulcers who were referred to the Gastro-Intestinal Clinic of the Western General Hospital, Edinburgh, between April, 1963 and August, 1964 have been examined by the investigator. Emphasis in this initial assessment was laid on social variables and psychiatric state. Over the course of three years eighty

patients were treated medically and ninety-eight came to operation. These patients were followed up at six-monthly intervals over three years, and physical and psychiatric progress in these patients assessed at each interview.

Definition of Peptic Ulceration

It is necessary at the outset to define peptic ulceration for the purpose of this investigation. Peptic ulceration has been restricted to ulceration occurring in the stomach (gastric) or duodenum (duodenal) or in combination at both sites. Ulceration of the oesophagus or in Meckel's Diverticulum has thus been excluded.

The Beginnings of the Investigation

The investigation was initiated by Dr. (now Professor) Wilfred Card, then Physician-in-Charge of the Gastro-Intestinal Unit, Western General Hospital, Edinburgh. He approached Professor Morris Carstairs of the Department of Psychological Medicine, Edinburgh University. Dr. Card had long been interested in the personalities of patients suffering from chronic peptic ulceration. He and his colleagues were primarily concerned about the failures of operative treatment, and their clinical hunch was that the key to some at least of the failures lay in the personality of the patient. Patients with identical organic disease did not have the same operative outcome. Dr. Card had two questions which he hoped the psychiatrist would be able to answer.

1. Can the psychiatrist categorise peptic ulcer patients into groups in terms of personality characteristics?
2. Can such categorisation help to identify patients with a more or less favourable prognosis?

It was clear from these questions that the clinical staff considered that there was a third dimension in the peptic ulcer problem. Dr. Card and his colleagues were primarily physicians and surgeons, but they were seeking the aid of the psychiatrist to study the "psychiatric" aspect of the disease.

Composition of the Gastro-Intestinal Unit, Western General Hospital

Since the composition of the Unit is unusual and its characteristics have determined the patients referred to it, the information available about the patients, and the treatment undertaken, it is necessary first to describe the Unit. It was originally set up by Sir John Bruce, Surgeon, and Dr. Wilfred Card, Physician, who considered that many chronic gastro-intestinal diseases are a combined medical and surgical problem. They argued that continuity of care could not be given if patients were divided into "medical" and "surgical" categories. It seemed more logical to treat these patients in a unit where a team of physicians and surgeons would work together; full information about the patients would be available to physicians and surgeons, and decisions concerning treatment would be taken in much closer collaboration.

Opportunities for research into gastro-intestinal problems would be afforded more readily in a unit of this nature because of the clinical material available. A feature of the Unit from the beginning has, indeed, been its interest in research.

There are two sub-divisions in the Unit, each headed by a physician and surgeon, and the junior staff is common to both.

The Unit offers in-patient treatment with a male and a female ward which are not sub-divided into medical or surgical beds, and runs two out-patient clinics per week, headed by the two consultant physicians of the Unit. Follow-up clinics by physicians and surgeons also take place weekly. Though occasional

emergencies are admitted this is not common, and admissions are usually arranged by the medical staff from a waiting list. Operations carried out are on the whole elective.

Preliminary Investigations

It seemed necessary to the psychiatrist, when faced with this problem, to get to know the Unit first of all, both the staff and the type of patients who were treated there.

Ward rounds were attended, and also the weekly Grand Round. At this all members of the staff, both clinical and research, are present. New in-patients whose investigations are completed are presented for discussion, and decisions about treatment taken. Members of staff also present out-patient problems for discussion. These sessions proved an invaluable opportunity to find out which type of patients was likely to be admitted, the investigations undertaken, and how decisions about treatment were made. In particular, decisions to operate in peptic ulcer patients depended on clinical findings, for example, the presence of complications, mainly bleeding and stenosis, length of history, especially a long history with previous failure to respond to medical treatment, and work record. A patient with a good work record, with recent loss of work due to increased ulcer dyspepsia was much more likely to be considered suitable for operation than a man whose work record seemed poor out of all proportion to his ulcer disability. Clear cut cases with definite complications presented no real difficulty in decision. There remained many cases with no definite evidence of complications who had a real disability from pain alone. In these especially, the concept of 'goer' and 'non goer' was mentioned. It was clear that a 'goer' was a patient who was thought to have coped well with disability from his ulcer in the past and who would be expected to do well with treatment. The reverse held for the

'non goer'. It was decided to take advantage of this clinical hunch of 'goer' which obviously was a rating of personality. The psychiatrist asked all the senior clinical staff at the Unit, including the ward sister, to write out what each individual thought constituted a 'goer' and a 'non goer' (copies of the letters are included, Appendix III). These, though varied in their form, and stressing some different aspects, did have many features in common, and offered a valuable starting point in the setting up of this study.

Design of the Peptic Ulcer Study

In a study such as this the first essential is the knowledge of what is being sought and how it is to be obtained. During the process of data collection the experimental method must be seen to be held constant in order that results obtained may be credible. The emphasis, therefore, in the initial stage must be laid on careful planning.

The starting point in this study was two clinical questions. Clinically the hunch was that the personality of the patients was important in the outcome of treatment, and the belief that the concept of 'goer' and 'non goer' could be used in a predictive sense. In addition the clinicians were primarily concerned with the surgical outcome of treatment. This limited the scope of the survey to the examination of chronic ulcers with a fairly long history, as surgery in peptic ulcer is never chosen as the mode of treatment in the early case.

Design of the Initial Interview

As has been demonstrated in the preceding review of the literature

psychological factors are important in the aetiology of the disease, and in particular, the role of anxiety has been carefully examined. Possible sex differences have emerged in the ulcer population, and differences between the patients with duodenal and with gastric ulcers. Medically, agreement has been reached that duodenal ulcer plus gastric ulcer should be considered as duodenal ulcers, but in much of the psychiatric literature there has been great doubt into which group they should be placed. Conflicting reports of the incidence of psychiatric disease in a hospital group of peptic ulcer patients have been given, but the general consensus of opinion has been that psychoneurosis is important in this disease.

Bearing in mind, therefore, the lack of precise information, it was apparent that, before the outcome of treatment could be considered, it was necessary to define this particular peptic ulcer population.

Another factor governed the design of the study and in particular the necessity for a preliminary assessment of the patients; the specialist nature of the Unit in which the survey was to take place. It might be expected that peptic ulcer patients treated here would not be comparable to other peptic ulcer groups.

On the other hand it was foreseen that the particular nature of this Unit would prove beneficial to the survey. Patients are referred by their general practitioners for "assessment", not as in general medical and surgical units for consideration of medical and surgical treatment respectively. Since the investigator's aim was to examine treatment outcome and psychological factors which might influence this in surgically treated patients, and compare findings with those in a medically treated group, it was felt that the latter group in this study would afford a fair comparison. It was hoped to avoid to a large extent faults which have been noted in studies from surgical units which have compared results of operative treatment in

4. Other neuroses, 310-318, excluding neurotic-depressive reaction (314).
5. Character disorder only (320-326).
6. Nil.

The character disorder in the group was then classified. Two sets of patients were classified under this heading, firstly, those patients who were allotted to Section 5 above, and secondly, those patients who were judged to be suffering from illnesses allotted to sections 1-4, if the interviewer considered that these symptoms were arising on the basis of a character disorder. Again not all categories under 320-326 were used, but only those which might be expected to feature prominently in a group of ulcer patients.

1. Immature personality (321), and inadequate personality (320.3).
2. Schizoid personality (320.0).
3. Psychopathic personality (320.4 and 320.5).
4. Pervert (320.6).
5. Epileptic personality - where the definite symptoms of the epileptic personality existed, though this is not classified under a definite separate heading.
6. Other - all others to be included, also definite obsessional personalities not amounting to category 313 (listed under Psychoneurotic disorders in the International Classification).
7. None.

The following four factors, although classified under (320-326) were then separated as associated factors, rather than personality disorders.

1. Alcoholic - 322.
2. Drug Addict - 323.
3. Epilepsy - 353.
4. Subnormal - 325.

5-9 various combinations of these factors.

0 None.

The classification of psychiatric symptoms, having been decided upon, a standard textbook of Clinical Psychiatry was consulted, (Clinical Psychiatry - W. Mayer - Gross, Eliot Slater and Martin Roth, 1960). Clinical features of each illness as enumerated, had to be present before the patient was allotted one of the diagnostic categories above. For example, a patient who declared that "his ulcer was getting him down" was not labelled depressed unless he felt unhappy, unfit to cope with day to day affairs, or to face the future which seemed gloomy. The presence of some at least of the following symptoms made the diagnosis more certain; lack of energy, difficulty in concentration, excessive fatigue and insomnia, with loss of interest, and possibly ideas of suicide.

The Questionnaire

There were two main reasons for the inclusion of a questionnaire in the initial interview; firstly, the realisation of the subjective nature of the psychiatric diagnosis in the ulcer group, and secondly, the aim of narrowing down the concept of 'goer' and 'non-goer'. An objective measurement to check the psychiatric diagnosis was thus sought. The limiting factor was time, especially as it was hoped to include out-patients in the survey. Originally the M.M.P.I. was considered but for this reason was rejected. It was decided, finally, that the questionnaire would consist of three sections.

1. Taylor Manifest Anxiety Scale (from M.M.P.I.) . Twenty questions were selected at random.
2. Psychasthenic Scale (from M.M.P.I.). Twenty questions were selected at random.
3. Section devoted to the concept of 'goer' and 'non-goer'. A list of 'needs' as defined by Murray in "Explorations in Personality"

was compiled and the clinicians' letters outlining 'goer' and 'non goer' were re-examined. All mentioned anxiety, thus reinforcing the inclusion of Section 1 of the questionnaire. Their letters were analysed by the interviewer in terms of Murray's 'needs' and by selecting those six that came up most frequently this section of the questionnaire was compiled. Four questions in each of those six topics were chosen at random from Murray's test; n. Counter-action and n. Endurance represented the characteristics of the 'goer', and n. Aggression, n. Succourance, n. Exhibitionism and n. Autonomy the non-goer'.

It was realised that this would be open to criticism. It depended on the clinicians being able to articulate their 'hunches' correctly and on the psychiatrist's ability to interpret the letters correctly. Also a questionnaire made up in this way cannot be compared with results in other studies. It was hoped, however, that even this crude measuring instrument, tailored specifically for the requirements of this survey, would act as a check on the subjective clinical assessment and serve for useful intergroup comparisons.

Design of the Follow-up

One obvious factor dominated the design of the follow-up; it must be kept separate from the normal clinical treatment of the patients. Were the psychiatrist's findings and opinions allowed to intrude, it was inevitable that the clinicians' judgements might be swayed, particularly in the doubtful case, and thus contamination of the results would occur.

For this reason, the results of the psychiatrist's assessment at initial interview were not recorded in the patients' hospital case notes, and the follow-up of the ulcer patients proceeded at a separated clinic which was held in the Western General Hospital.

It was designed to follow-up all the ulcer patients who had been interviewed originally. As has been pointed out in the study of the literature, roughly fifty per cent of ulcer patients admitted to a teaching hospital receive surgical treatment, so it was reasonable to assume that the original group would be approximately divided in two; one half receiving medical treatment and the other half being operated on.

Also, suggestions have arisen from a study of the literature that results of surgery for peptic ulcer apparent in the few months following operation, are not necessarily the same results that will be observed, say, in two years time. Outcome of surgery can vary in the individual patient depending on the time of assessment since operation. It was obvious, therefore, that the follow-up would have to extend over a reasonably long time, and that a balance would have to be struck between what was practical and what was desirable. Finally a follow-up of two and a half years was decided upon, though, as will be seen when the follow-up of the patients is discussed in more detail later, the group was ultimately followed up for three years. With this concept of change in an individual's result of operative treatment dependent on time, it was necessary to decide how often the patients should be seen. Six months was chosen as a reasonable time limit; firstly, a six monthly time interval was deemed reasonably long in which changes could take place and be recorded, and secondly, it was felt that an attendance once every six months at the hospital would not place too onerous a burden on the patients.

Follow-up interviews were conducted by the same investigator as had obtained at the initial interview. At each interview the patients would receive both a physical and a psychiatric assessment. It was desirable in order to eliminate observer bias, that the same interviewer should not assess both the physical and the psychiatric state of the patient. In each case

the investigator provided the psychiatric assessment. The problem of physical assessments in the surgical patients was easily solved. Mr. W. P. Small, surgeon in the Gastro-Intestinal Unit, agreed to assess those patients who had been treated surgically. The medical patients proved to be more of a practical difficulty. While some, it was envisaged, would be followed up by the physicians of the Gastro-Intestinal Unit, others, after assessment, by the hospital, would be returned to the care of their general practitioner. Finally it became obvious that physical assessments of the medical patients would also have to be undertaken by the investigator. It was decided to take advantage of the fact that chronic peptic ulcer is a relapsing disease which tends to follow a set pattern in a particular individual over a number of years. For instance, a patient knows how many bouts of ulcer dyspepsia he can expect over a given time, and the character and the duration of the bouts also tend to be constant to him. He can thus assess a six-months period as being much as he would have expected, worse or better. The survey was designed to incorporate this by provision being made to record verbatim the patient's medical symptoms at each interview under definite headings, for example, number of bouts of ulcer dyspepsia, severity of symptoms, duration of bout, presence of new symptoms, and work lost through ulcer dyspepsia in the previous six months.

Though the primary aim of the study was to examine the influence of psychological factors on treatment outcome, the preliminary study of the literature, and conversations with the physicians and surgeons of the Unit, had suggested other possibly fruitful and related areas of investigation, for example, the relationship between alcoholism and operation for peptic ulcer, the suggestion of falling off in work record of the patients post-operatively, the smoking habits of the patients, sex differences in surgical outcome, and how the indications for operation might influence the outcome. The follow-up

study was, therefore, designed to investigate these factors.

The design of the survey was made as simple and straight forward as possible, terms were defined closely, and criteria made as objective as possible. In this way, it was hoped, firm data would be obtained, though obviously some subtle differences would be lost in the process. This sacrifice, it was deemed, would be worthwhile if the hope proved successful.

Furthermore it was realised that the scope of the survey was very wide and that this would make handling of the data difficult, and that conclusions drawn might be from rather tenuous evidence. On balance it was felt such a wide survey was necessary, in the first instance. By narrowing it down to one particular aspect vital information might be lost. This study was, therefore, designed as a preliminary investigation, from which it was hoped to draw out ideas. From these, in turn, it should be possible to formulate and then to test much more precise hypotheses.

Number of Patients in the Survey

This was obviously governed by the clinical material available, the length of time involved in the collection of the patients, and the number necessary to make statistical analysis of the data practicable.

No definite figures were available of the number of peptic ulcer patients seen by the Unit each year. Inferences could however, be drawn from the figures that two to three gastric operations on average took place per week, and that possibly roughly a similar number of patients would be treated medically; twelve new out-patients per week were seen at two consulting sessions. Since a figure of ten per cent had been quoted for the number of peptic ulcer patients seen at general medical clinics, it was reasonable to suspect that a larger proportion of patients at a specialist gastro-intestinal unit would have peptic ulcers.

A figure of 200 patients in the survey, therefore, seemed a practical possibility; they could be collected in a reasonably short time, it would be possible to keep in contact with such a number of patients over some years, and it would provide sufficient material for statistical analysis.

Selection of the Patients

The patients were already a selected group being without exception referred by their general practitioners. Out-patients were hospital clinic attenders referred in this way. In-patients also had been general practitioners' referrals, seen at the clinics and placed on the waiting list for admission by one of the Gastro-Intestinal Unit Consultants. Very occasionally a patient by-passed the Hospital Clinic and was seen by a consultant on a domiciliary visit before admission. Private patients admitted to the ward by one of the consultant were also included in the study because they too had originally been referred by their general practitioners. The investigator was anxious to avoid further selection, in order that this sample might be a representative one of peptic ulcer patients treated by the Gastro-Intestinal Unit. All patients with peptic ulcer, irrespective of their age, were included. In practice all were over the age of fourteen years, children with peptic ulcers being treated either in the Paediatric Unit of the Western General Hospital, or at the Sick Children's Hospital.

Criteria of Entry for in-patients

The emphasis in the survey lay on the outcome of treatment, so only those patients admitted for treatment were included, that is, they had been referred to the hospital complaining of ulcer symptoms. Thus patients in whom a peptic ulcer was found incidently in the course of investigation for other symptoms were not included. A further group of in-patients was

excluded; they comprised a group of patients admitted overnight usually at the weekends for gastroscopy. Though technically in the hospital records these people are recorded as being in-patients, it was felt that their admission was for the purposes of a single investigation only, and that they did not come under the heading of "treatment".

All in-patients were included who had not had definitive surgery for peptic ulcer. Previous perforations treated by simple closure were thus included, but perforation treated by partial gastrectomy were not. It was felt that the problem of recurrent ulceration after definitive surgery was outwith the scope of the present survey.

Criteria of Entry for out-patients

There were two possible sources of clinical material (1) new out-patients, and (2) returning out-patients. It was decided to exclude the latter group. Decisions concerning treatment in the majority of these patients would already have been taken for one reason or another. Inclusion of these patients was a possible source of contamination of the survey results; it was perilously near the criticism that had already been made of those studies which included a large proportion of 'rejected' patients as a medical control group.

Thus only new out-patients at their first attendance at the hospital fulfilled the criteria for entry to the study.

In practice close touch was kept with the ward, and each few days a list obtained of new patients admitted with a presumptive diagnosis of peptic ulcer. Patients were thus seen within the first week of admission to hospital, the great majority being within one or two days. The interviewer attended two new out-patient sessions per week run by the Gastro-Intestinal Physicians.

She did not attend the surgical clinics because patients with ulcers were referred to this for consideration of surgery, which might take place either in the Gastro-Intestinal Unit, or in the General Surgery Wards. Only out-patients referred to the Gastro-Intestinal Unit were thus included. The physician, having made a clinical diagnosis of peptic ulcer then introduced the interviewer, describing her as a psychiatrist who was a member of the Unit, and whose interest was "research into peptic ulcers". The patient was then asked to accompany the interviewer who would describe the project in more detail.

The Initial Interview

In so far as it was possible the interview followed a set pattern, this being made comparatively easy because a single individual was conducting all the interviews. When the patient was seen a presumptive clinical diagnosis had been made of peptic ulcer. Deliberately no medical history was taken by the interviewer so as to minimise the likelihood of contamination of her findings by knowledge of the site of the ulcer.

The interview was opened by the interviewer describing herself by name and explaining that she was a psychiatrist attached to the Gastro-Intestinal Unit as a member of the staff. She explained that her interest was one of research only, that questions were completely confidential, answers would not be entered in the hospital records, and that her findings would not affect the patient's treatment in any way. It was also explained at this stage that participation in the survey involved attendance at the Western General Hospital at a clinic where every endeavour would be made to make the time of appointment as convenient to the patient as possible. Attendances were to be at six-monthly intervals over the subsequent two to three years. The patient was then asked if he wished to refuse to enter the survey. In fact

no refusals were forthcoming.

The interview then led directly on to the items on the interview schedule. This was structured so that the same information would be available on each patient. (A copy of the interview schedule is reproduced in Appendix III). Where possible the questions were asked and the answers entered in the schedule in the order given, but often information was offered without the patient being asked and as much as possible he was allowed to express himself freely. It was felt that rapport between the interviewer and patient was more readily established than by adhering too rigidly to the order in the schedule. The interview was designed to provide information based on the ideas formulated during the preliminary investigations, and discussed in the section on the design of the survey. It was divided into fourteen parts; the main topics of enquiry are indicated as follows, and ratings are detailed in the copy of the schedule.

1. Routine Information

The date of the interview was recorded and the status of the patient, that is, in-patient or out-patient. This was for the purpose of future follow-up designed to take place at six monthly intervals.

2. Personal Data

The name and address of the patients and that of his general practitioner. Again this was of no significance in the research project but for the tracing of patients. He was also given a survey number (1-205). The patient's age, sex and civil state were all recorded as being of relevance to the investigation. The patient's occupation, or former one if retired, or that of the husband in the case of a housewife was noted, in order to assess socio-economic position as defined by the Registrar General's Classification of Occupation (1960).

3. Family Background

The father's occupation was recorded first. This was necessary for the investigation into any observed differences in shift in socioeconomic background between these and the present occupation of the patients, which could be a reflection of the ambitions of the group of patients.

Details were then noted of paternal age at the time of the patient's birth, and of the patient's age at the time of the parents' deaths if these latter events had taken place.

He was then asked about the number of his sibs and his ordinal rank in the family.

The presence of remarriage of a parent and the number of step-siblings was noted in some cases.

4. Childhood of Patient

He was asked if his mother had worked outside the home during his childhood, and then required to assess the mother's role in the family.

Absence of either parent by death or otherwise from the home during the childhood of the patient (that is up to the fifteenth birthday) was noted and how old the child was at the time, and whether a substitute for the absent parent was provided.

The "family" was defined as consisting of parents and sibs, and specific physical and nervous illness in the unit was inquired into.

Details of the educational level attained by him were obtained.

It was noted also if the patient had attended a special school or class on account of physical or mental defect, as a result of an order by the Court, or as a result of a combination of these factors.

He was then asked to rank himself, whether as a child at home and

at school he had been considered to be very easily disciplined, resistant to discipline, or averagely so. The patient was encouraged to go into details before he was assigned a rank.

5. Adult Life Pattern

The patient was asked to give details of his working life, the number of jobs he had held, why he had changed, details of wages earned and any periods of unemployment. He was asked specifically, if he had not volunteered the information, whether he had ever been sacked from a job, and the reasons for his dismissal.

He was then asked to rate himself as a very ambitious person, more so than his contemporaries, about average, or less ambitious than his friends. He was encouraged to give details as to how he reached his decision and these were recorded.

Recent job changes (defined as taking place in the year before entering the survey) were enquired into. If a change had taken place, any change in status was ranked by the interviewer on money earned, length of working hours, prospects of promotion. It was hoped to seek leads from this information as to why a patient with a long continued chronic illness should seek hospital advice at this stage. The patient was then asked about his adult financial circumstances, how much he earned per week or monthly, whether he owned his house or lived in rented accommodation, whether he was up to date or in arrears with the household bills, whether he had any articles on hire purchase or was a member of clothing clubs, and how much per week was necessary to meet these commitments.

Housewives were rated on the earnings of the head of the household. Details of this were included in the survey as many writers have pointed out the role of financial stress in exacerbations of ulcer

dyspepsia, and also as a possible factor in the seeking of hospital advice.

6. Marriage and Social History

The age of the patient at marriage was recorded, and how old the spouse was compared to the patient. He was asked about his relationship with his wife, and success or failure of marriage was rated by the interviewer from the details supplied. Decision to end the marriage was then enquired about and noted.

Termination of marriage by death, separation or divorce was noted, and how long previously this had occurred.

The number of the patient's children was recorded, and an assessment of the parent-child relationship made by the interviewer from details supplied by the patient.

The number of times the patient had been married was recorded and details similar to above of second and subsequent marriages obtained. Social contacts outside the marriage were then considered. These included church and community activities, sports, hobbies and social visiting.

7. Smoking Habits

Details of the smoking habits of the group at initial interview were then recorded.

8. Eating Habits

The amount of interest that the patient took in his food, prior to the onset of his ulcer dyspepsia, was noted.

9. Drinking Habits

Details of these were included because of the questions raised in the literature of alcoholism following operation for peptic ulcer. It was felt that assessment of drinking before treatment for

comparison between operation and non-operation groups was essential in this context. The frequency of drinking was recorded initially, and whether he was in the habit of drinking on his own. An attempt was then made to assess how much the patient drank both in spirits and in beer. This was regarded with some doubt as it depended entirely on the patient's own assessment.

Stress due to the patient's drinking habits was then rated in the sphere of his life, at home and at work, and whether his drinking habits had ever necessitated treatment for alcohol addiction.

10. Psychiatric Symptoms

The patient's previous psychiatric history was recorded first. He was defined as having a history of previous psychiatric disturbance if he had been treated either as an out-patient or an in-patient at a psychiatric clinic, or had gone to his general practitioner complaining specifically of his "nerves". It was realised that this would probably give an artificially low figure for the group but in this retrospective assessment it seemed preferable to use these definite "events" in the patient's life, rather than have the interviewer attempt to assess this in answer to some vague question such as "have you ever had trouble with your nerves?".

Details of length of stay in hospital, diagnosis, treatment, number of out-patient attendances were recorded on the schedule. Later, wherever possible, the patients' records were obtained and clinical findings from these recorded.

The patient's present psychiatric symptoms were then obtained by direct questioning by the interviewer. In essentials, this section comprised a shortened version of an ordinary psychiatric

interview, for example, mood change, presence of anxiety symptoms, tension, insomnia, delusions, hallucinations, loss of memory, lack of concentration, obsessions and phobias, and where appropriate, the presence of organic symptomatology. Full details with the length of time during which symptoms had been present were entered on each schedule. From this the patient was rated a) having psychiatric symptoms (yes) or b) having no psychiatric symptoms (no). The appropriate psychiatric diagnosis was then recorded under the headings discussed in the section on the design of the study.

11. Ulcer Precipitating Factors

The patient was then asked what he considered had caused his ulcer, the answers noted verbatim.

12. Why Referral Now?

He was then asked why, at this stage in a chronic relapsing illness, he had come to hospital and who was instrumental in initiating referral. The response to these questions was also recorded verbatim.

13. Ulcer Diagnosis

The column was not filled in until all the initial interviews were completed. Reference to the case notes was necessary, and only those patients in whom the clinical diagnosis of peptic ulcer had been confirmed, by X-ray, gastroscopy, or at operation, were included in the survey. The patients were divided according to site of ulcer (1) gastric ulcer, (2) duodenal ulcer, (3) duodenal ulcer plus gastric ulcer.

14. The Questionnaire

In each case the questionnaire was given by the interviewer, who read out the questions to the patient, and noted down his answer, 'yes' or 'no',

to each question by ringing the appropriate word in the schedule.

At the conclusion of this the formal interview was at an end. Many patients stayed to ask questions but the interviewer was careful not to get drawn into discussion about the physical treatment of the patients.

The patient was then reminded of the follow-up interview in six months' time and his preference for time of recall recorded on the top of his schedule.

After the patient had gone the interviewer wrote a formulation of the case on the back of his schedule, giving details of the psychiatric diagnosis where appropriate, a description of the personality of the patient, and any possible precipitating factors in the patient's illness.

The pilot study

Twelve patients were seen initially. They were all in-patients, as the interviewer was anxious to find out how long the investigation detailed above would take.

The entire interview took about one hour which was considered to be a reasonable length of time in which to gather the relevant information.

The time factor was not a matter of concern in the in-patients, who indeed were pleased, as was noted from the pilot study, to pass an hour of their hospital day in this way. It was important, however, in the case of the out-patients, whom it was hoped to see immediately after their initial interview with the consulting physicians; it was felt that an hour was the maximum extra length of time that these patients should be asked to stay at the hospital on the occasion of their first referral.

No difficulties arose, the patients were very co-operative, talked freely, and the information sought was forthcoming. The schedule was checked with

the case notes. No major discrepancies were found, though it was noted that the figures for drinking and smoking given to the interviewer tended to be higher than those given to the ward physicians. The insistence on the part of the interviewer that information given was confidential, and would not play a part in their treatment, seemed to be valuable in this respect, and was repeated to each patient in the survey.

For the reasons of selection, and because the information in the schedule had been checked against the case notes, the patients in the pilot study were not included in the main survey.

Time Schedule of the Initial Interview

Each interview last between forty minutes and one hour. Two hundred and five patients were seen with a presumptive clinical diagnosis of peptic ulcer, between the beginning of April, 1963, and the middle of August, 1964, when the collection of patients stopped, as the envisaged figure of 200 had been reached.

Missed patients

During the course of the collection some patients were missed. Reasons for this were:-

- 1) At the beginning of the survey, before the arrangements at the out-patient sessions had become a matter of routine once or twice the consulting physician omitted to refer a patient, in whom he had made a presumptive diagnosis of peptic ulcer, to the psychiatrist.
- 2) Twice the entire out-patient clinic consisted of peptic ulcer patients and on each occasion one patient was unable to wait for interview.
- 3) The interviewer was absent on holiday for three weeks in September 1963, and for one week during April, 1964. Absence through illness accounted for another week during the time of collection.

- 4) Only one patient was definitely excluded from the survey. He was Polish, spoke practically no English, and in addition was very deaf.

An effort was made to trace these missed patients but it proved unsuccessful. The number of out-patients referred each month to a particular unit is kept, but there is no breakdown by diagnosis. Another method of approach was via the hospital index number which is given to each new out-patient on first referral to hospital. Unfortunately no central record is kept of the date when the index number is given to a particular patient, and there is no method of selecting those index numbers which have been given to patients attending a particular clinic, for example, the gastro-intestinal clinic.

In the case of patients admitted to the Unit, hospital records provide the number of patients discharged each month, broken down by diagnosis. This possible source of information unfortunately proved valueless as the criterion of entry to the study was admission, not discharge of the patient. During the first and last month of the collection of patients the number of patients discharged was not necessarily the number of patients who should have been seen by the investigator. Also official figures for in-patients include those peptic ulcer patients who are admitted overnight for a particular investigation, and who did not fill the criteria for entry to the survey.

It is possible, therefore, to give only a rough estimate of missed patients based on personal recollection. It is considered that, for the reasons detailed above, approximately ten to twelve patients have been missed. With the exception of the one patient deliberately excluded, reasons for omission are chance ones which have no real bearing on the subject of the survey. It was hoped, therefore, that these omissions would not effect the survey as a whole, and that the sample of patients collected was representative

of the ulcer population treated by the Gastro-Intestinal Unit.

Subsequent Steps

A After all the patients had been seen the interviews were coded. The hospital case notes were obtained, and the diagnosis after investigation by the clinical staff of the Unit was noted. Only those patients in whom the presumptive clinical diagnosis of peptic ulcer had been confirmed were included in the study. Twenty-seven patients were thus omitted, so the main survey consisted of 178 confirmed chronic peptic ulcer patients.

Information from the schedule was then punched on Hollerith Cards from which tapes were prepared for computer analysis of the data. This analysis was carried out by the Atlas Computer at Chilton.

Patients omitted from the survey

Twenty-seven patients in whom the presumptive clinical diagnosis of peptic ulcer had not been confirmed comprised this group. Thirteen were men and fourteen were women.

The physical and psychiatric diagnoses are shown in Table 1 - Appendix III. Twenty-three patients (eighty-five per cent) had psychiatric symptoms, all of the women and nine of the men (sixty-nine per cent). The difference between sexes in this respect in this group reach significance ($\chi^2_1 = 11.108$, $p < .001$).

Ten patients had no organic findings whatsoever, and in all these patients the primary diagnosis was a psychiatric one. Of the remaining seventeen with some organic condition, thirteen had psychiatric symptoms, not, it seems, by any means always reactive to the organic disease.

By any standards, this would appear to be a very high proportion of patients with presenting psychiatric symptoms, when it is borne in mind that these patients have in fact been referred to a general hospital.

CHAPTER 4

THE RESULTS OF THE INITIAL INTERVIEW

(The tables relevant to this chapter comprise Appendix IV)

RESULTS OF INITIAL INTERVIEW

Aims

This is a within-group study of the ulcer population, the aims of which are:-

1. Description of this ulcer population.
2. Comparison between the inter-diagnostic subgroups, that is, a) patients with duodenal ulcer, b) patients with gastric ulcer, c) patients where duodenal and gastric ulcers coexist.
3. Comparison between the males and the females.
4. Comparison between the in-patients and the out-patients.
5. Baseline assessment, before treatment, of the patients from both a physical and a psychiatric point of view. This was regarded as essential before any conclusions could be drawn from the follow-up data.

Results

In the exposition of the results the following abbreviations will be used throughout:-

DU = patient with duodenal ulcer.

GU = patient with gastric ulcer.

DU+GU = patient with a duodenal and a gastric ulcer.

A summary of the results in this section, with the ulcer populations divided into the above groups is given in Appendix IV, Table 1).

Ulcer population

One hundred and seventy-eight patients with confirmed peptic ulcer were seen between the beginning of April, 1963 and the middle of August, 1964 inclusive, and these comprised the 'ulcer population'. All were chronic peptic ulcer patients, with a length of history ranging from three months to

fifty years. The average length of history before entering the survey was 12.4 years, and there was no significant difference between the groups in this regard.

One hundred and eleven (sixty-two per cent) were in-patients and sixty-seven (thirty-eight per cent) were out-patients.

Source of the Patients

The patients were grouped according to the home address given at the head of the schedule. Foreign patients were grouped as their home address, not as a temporary Edinburgh address.

The following figures were obtained:-

Edinburgh	134,	75.2%.
Scottish Counties	38,	21.3%.
United Kingdom apart from Scotland	2,	1.1%.
British Commonwealth	2,	1.1%.
Foreign countries	2,	1.1%.

During 1964, 9844 patients were admitted to the Western General Hospital (4097 males and 4847 females). They were classified as the ulcer patients with respect to origin -

Edinburgh	5336,	59.6%.
Scottish Counties	3370,	37.6%.
United Kingdom apart from Scotland	217,	2.4%.
British Commonwealth	20,	0.2%.
Foreign Countries	1,	-.

More of the ulcer patients, therefore, came from Edinburgh, and fewer from the Scottish Counties. A two by two table was constructed comparing the two populations for the number of patients who came from Edinburgh with the others. The difference is significant ($\chi^2 = 19.887$, $p < .001$), but can

probably be accounted for by the numbers of out-patients, who are much more likely to come from the city, included in the ulcer sample. Patients referred from a distance are frequently admitted directly to the hospital for investigation rather than attend as out-patients. Unfortunately this statement cannot be proved as no figures for out-patients attending the Western General Hospital are available.

Situation of the Ulcer (Table 2)

There were 137 (seventy-seven per cent) DU's, twenty-eight (sixteen per cent) GU's, and thirteen (seven per cent) DU+GU's, that is, almost five times as many DU's as GU's, and 10.5 times as many DU's as the DU+GU group.

The figures for in-patients and out-patients were as follows:-
in-patients 111; DU's 80, GU's 21, DU+GU's 10;
out-patients 67; DU's 57, GU's 7, DU+GU's 3 (Table 3). Therefore, fifty-eight per cent of DU's were admitted, seventy-five per cent of GU's, and seventy-seven per cent of DU+GU's.

There was a tendency for the patients with gastric ulcer and also for the group where two ulcers coexist to be admitted to hospital more readily than the patients with duodenal ulcer and this fits in with the clinical picture of the ulcers. In gastric ulcer there is often considerable difficulty in differentiating between the malignant and simple ulcer, and this frequently necessitates in-patient investigation.

Sex Distribution (Table 4)

The group comprises 133 males - 106 DU's, 16 GU's and 11 DU+GU's, and 45 females - 31 DU's, 12 GU's and 2 DU+GU's. The ratio of male to female patients in each category is:- DU, 3.4:1, GU, 1.3:1, DU+GU, 5.5:1, so that there were comparatively more female patients with gastric ulcer, a

finding which fits in with other described ulcer populations. Rather surprisingly this sex difference between the groups was not significant at the .05 level ($\chi^2 = 5.674$, applying Yates correction because of one very small cell). The ratio GU:DU and DU+GU for men was 1:7.3 and for women 1:2.8. Comparing the DU's and DU+GU's with GU's for sex differences $\chi^2_1 = 5.434$, $p < .05$, but comparing DU's with DU+GU's $\chi^2_1 = 0.330$, so the difference lies between the gastric ulcer patients and the rest.

There was no significant sex difference between the in-patients and the out-patients.

There are two available populations for comparison purposes, the general population (from the Annual Report of the Registrar General for Scotland, 1964), and the in-patient figures from the Western General for 1963-1964, (obtained from the Home and Health Department, St. Andrews House). Table 1 shows that the sex distribution of the ulcer population differs from both these populations, in being predominantly male.

Age of the Patients (Table 5)

The mean age of the total group was 44.07 years (SD 16.67). For the males the mean age was 43.29 (SD 18.07), and for the females 46.40 (SD 11.30). The tendency was for the women to be slightly older than the men before seeking hospital advice. Either they could be older at the onset of the disease, or suffer longer than the men before their complaints necessitate referral to hospital. This difference in age was not, however, significant (using the Kolmogorov-Smirnov Test). Breakdown of the ulcer group into its diagnostic and patient status groups showed no significant age difference, so, for the purpose of comparison with other groups the ulcers could, in this respect be treated as a whole. Compared with the general population, (Table 5), the ages of the ulcer population were significantly different ($p < .01$) and

similarly when the males were compared. A similar tendency was apparent when the females were compared but the difference did not reach significance. This is a reflection of the older patients seeking hospital advice. Young people suffering from peptic ulcer do not readily come to hospital.

A more valid comparison, therefore, was with patients coming to the Western General Hospital. No figures were available for out-patients, but in-patient statistics for both medical and surgical patients (excluding casualty figures and all patients under twelve years) were obtained, that is, the process of referral to hospital, and the age range of the two populations was the same. The hospital figures for 1963 and 1964 showed no significant differences with respect to age and sex (Kolmogorov-Smirnov Test). Figure 6 shows the cumulative frequency curves of the ages of the ulcer population and the ages of the Western General in-patients for 1963-1964. The ulcer group is significantly younger ($p < .01$), and this applies to the males ($p < .01$), but there is no significant difference in the female populations. From the curves it can be seen that the Western General female population tends to be younger than the male, while the opposite holds good for the ulcer population.

Munro in 1963 and 1964 collected an out-patient group from medical and surgical clinics at the Western General Hospital in order to obtain a control group with which to compare a group of patients admitted to psychiatric hospitals with depressive illness. His figure of 49.3 years for the mean age of his control group fits in with the above findings.

Civil State

Tables 7 and 8 depict the figures obtained for the ulcer group. When separation and judicial separation are counted as single the following is found:-

	<u>Males</u>	<u>Females</u>
Single	12%	13%
Married	83%	80%
Widowed or divorced	5%	9%

Figures for males and females are thus practically identical.

Similarly it can be seen from the tables that there is no significant difference between in-patients and out-patients and diagnostic groups.

Table 8 also shows the marital status of the general population as obtaining at June 1963, which is quite different from that of the ulcer population. Comparisons, however, are not possible, as the two groups differ greatly with respect to age. The younger people, who tend to be single, are missing from the hospital group.

It was more reasonable to compare the ulcer group with the in-patients of the Western General in 1963 and 1964, even though the latter group is a little older. For this, the classification had to be changed a little, as the available figures were divided into married, single and others. Using this classification, there was no significant difference between males and females in the ulcer population, and there were no inter-diagnostic group differences. Although, because of the smallness of the numbers, two by two tables were constructed comparing married patients with the others, the difference between the ulcer population and the Western General in-patients was significant ($\chi^2_1 = 28.456$, $p < .001$) - a significantly larger number of the ulcer patients being married. Similar figures were obtained for the males ($\chi^2_1 = 29.125$, $p < .001$). Since both the total ulcer population and the male ulcer population are younger it suggests that the ulcer patients are settling down much more early in life. Also a significantly larger number of the women with ulcers are married when compared with the female hospital population ($\chi^2_1 = 4.614$, $p < .05$). This is not so marked as in the men, and

also the average age of the two female populations is the same. This renders the figures for the male ulcer patients more remarkable.

Social Class (Table 9)

In this section the working population was classified by occupation using the Registrar General's Classification. Housewives were classified according to the occupation of the husband, unemployed and retired people as their last job, and students were classified as their fathers.

There was a significant sex difference within the ulcer population ($\chi^2_4 = 9.781$, Yates correction applied, $p < .05$) with fewer females in social class II and III and more in class V. The females referred to the hospital with ulcer symptoms, were, therefore, of lower social class than the males.

There was no significant difference between the in-patients and the out-patients nor between the diagnostic groups.

The comparison between the ulcer group and the hospital in-patient population was not very easy, because of the sex difference between the populations and, in addition, a large number of the hospital in-patients were classified "unknown" (thirty-three per cent in 1963, and thirty-four per cent in 1964 - Table 10). Almost half the women in each year were not classified. This occurs because in the hospital records women are classified as housewives, and the occupation of the husband is not entered in the records. Discounting unknowns lessens the sex difference between the groups, and results in males and females being almost equally divided in the hospital in-patient group. There is a significant sex difference in the hospital group ($p < .001$), more females being in class II and fewer in classes IV and V. Comparing male patients with peptic ulcer with hospital males there is no difference, ($\chi^2_4 = 6.153$). Females with ulcer were, on the other hand, significantly

different ($\chi^2_4 = 32.638$, $p < .001$) when they were compared with other women admitted to hospital. There was a loading of women with ulcers in social class V compared with the hospital population (Table 11). Bearing in mind that this is a rough comparison only, it does appear that women, suffering from ulcers and coming from a lower social class, are more readily referred by their general practitioners to the hospital.

The social class of the patients was then compared with the social class of their fathers (Table 12). On the theoretical basis that the ulcer patient is pushing, hard-working and ambitious, one would expect them to do better than their fathers. Out of the total group, 176 patients were available for comparison as two patients had no knowledge of their fathers.

30% had moved up 1 class	}	= 42% had moved up.
12% had moved up 2 classes		
43% had stayed the same.		
8.5% had moved down 1 class	}	= 15% had moved down.
7% had moved down 2 classes		

These differences are significant ($\chi^2_4 = 10.980$, $p < .05$). Patients are significantly of higher social class than their fathers, and the shift has taken place from classes IV and V into class II, that is, from the unskilled and semi-skilled groups to junior executive group, but not into the professional group. While care must be taken with social class comparisons between different age groups (some occupations having been regraded, and there being an upward trend in the whole population) the figures are certainly suggestive.

Two factors may be present limiting the upward trend of ulcers into social class II only; a) the ulcer patient is rigid, hard working, without the extra "flair" for more promotion, and b) the educational level of the group. That this last reason is operative is borne out from some later

figures for the schooling of the group.

Parental Age at the birth of the Patient (Tables 13 and 14)

The tendency is for the women to be younger than their spouses, but the difference is not significant (Kolmogorov-Smirnov Test). There is no difference between the sexes, diagnostic groups, nor between in-patients and out-patients.

Parental Death during Childhood of Patient (Parental Loss)(Table 15)

Childhood in this study was defined as those years in the patient's life up to the fifteenth birthday.

Early years were defined as those years up to the twentieth birthday, In early years twenty-five patients (fourteen per cent) had lost their fathers, and twenty-one patients (twelve per cent) had lost their mothers. During childhood, sixteen patients had lost their fathers, and twelve patients had lost their mothers, that is, 15.7 per cent of the group had lost a parent before their fifteenth birthday. Brown's figure (1961) of 15.5 per cent for general practice patients losing a parent before the fifteenth birthday was practically identical, and Munro's figures for Western General out-patients attending medical and surgical clinics during 1963-1964, showed that 18.1 per cent of his group had lost a parent.

There was no significant difference between in-patients and out-patients in the ulcer group for parental loss ($\chi^2_1 = 2.262$, Table 15) so that the ulcer patients can be considered as a whole in order to compare them with Munro's patients. On comparison, $\chi^2_1 = 0.333$ (Table 16), so that there is no significant difference between the ulcer patients and Munro's out-patients with respect to loss of a parent.

Within the ulcer group the diagnostic groups were compared (Table 15); $\chi^2 = 5.152$, which is not a significant difference without Yates' correction

but when DU's were compared with DU+GU's, and DU's and DU+GU's were combined and then compared with GU's, the following was found:-

1. χ^2_1 (DU versus DU+GU), = 1.019 (without Yates' correction), so that these groups were alike.
2. χ^2_1 (DU and DU+GU versus GU) = 4.133, $p < 0.05$, but applying Yates' correction for one small cell, $\chi^2_1 = 3.064$, $0.05 < p < 0.10$.

Therefore, the only difference with respect to parental loss is between gastric ulcers and the rest, and this is significant only at ten per cent.

Parental Deprivation during Childhood of Patient (Tables 17 and 18)

This was defined as absence of a parent, including death, for more than three months. Two periods of absence counted as one, for example, absence of a parent for one year when the patient was three, and absence again when the patient was nine, counted as one.

The definition of childhood was as in the previous section.

120 patients (67.4%) suffered absence of one parent.

79 patients (44.4%) showed separation from father.

41 patients (23%) showed separation from mother.

Munro's figures, which defined childhood up to the sixteenth birthday, were as follows -

46.7% separated from a parent.

41.4% separated from father.

17.2% separated from mother.

It seemed, therefore, that significantly more ulcer patients were separated from a parent than the patients in Munro's control group ($\chi^2_1 = 16.726$, $p < .01$, Table 19). The difference appears possibly to lie in separation from their mothers, but the comparison was rather difficult because childhood as defined by Munro, lasted another year longer. This difference in

definition, on the other hand, would suggest that Munro's figures should be higher than the figures for the ulcer group, which has not been observed to be the case.

Sixty-eight per cent of the in-patients compared with sixty-six per cent of the out-patients suffered parental deprivation.

Once again when the ulcer in-patients are compared with the ulcer out-patients no significant differences emerge ($\chi^2_1 = 0.007$ for fathers' absence, $\chi^2_1 = 0.253$ for mothers' absence, Table 17). The group can, therefore, be considered as a whole.

GU's were compared with the rest, and DU's with DU+GU's (Table 18).

The only significant difference to emerge was found between GU's and the rest, and this occurred in respect of paternal deprivation, ($\chi^2_1 = 4.418$, with Yates' correction applied, $p < 0.05$) in that more patients with gastric ulcer had suffered paternal deprivation.

The high figure for separation from their fathers in the gastric ulcer group, on the premissis that parental deprivation is damaging, might suggest that these patients would suffer more from personality problems than the other groups.

Siblings of Patients (Table 20)

The mean size of the family from which the patients came is 5.4. For the ulcer group as a whole,

6% were only children,

60 (39%) came from families of 2-4 children,

97 (54%) came from families of more than 5 children,

43 (24%) came from families of more than seven children.

The ulcer group was then broken down further:-

	<u>DU</u>	<u>GU</u>	<u>DU+GU</u>
only	5.8%	3 6%	3.7%

	<u>DU</u>	<u>GU</u>	<u>DU+GU</u>
2-4.	37.2%	50.0%	46.2%
> 5	56.9%	46.4%	46.2%

The tendency is for fewer GU's to be only children and to come from smaller families than DU's. The difference did not, however, reach significance.

When the ulcer group was broken down for patient status the following figures were obtained:-

	<u>In-patients</u>	<u>Out-patients</u>
Only.	2.7%	10.4%
2-4.	38.7%	42.2%
> 5	58.5%	47.7%

The tendency is for out-patients to come from smaller families, but the difference was not significant ($\chi^2_2 = 5.452$, $p < .10$). There was no difference between the sexes.

Position of patients in Sibship (Table 21)

For the ulcer group as a whole:-

First child.	47	26%
Middle child.	70	39%
Last child.	51	29%
Only.	9	5%

One child was adopted and counted as an only child in the deprivation figures. He was brought up with an adopted older brother so that in this section he was included as a second child.

In-patients and out-patients were compared but the difference was not significant ($\chi^2_3 = 6.88$, Table 21).

Male and female patients were compared ($\chi^2_2 = 4.32$).

GU's were compared with the rest ($\chi^2_3 = 1.032$.) Yates' correction was

applied in all these cases.

Thus there are no significant differences between in-patients and out-patients, men and women and diagnostic groups in this respect.

Mother working outside the Home during Childhood of the Patients (Table 22)

The total ulcer group breakdown figures were :-

Not working 121, 70%.

Part-time working 29, 16%.

Full-time working 24, 13%.

Unknown and not

applicable 4.

More than two-thirds of the group had mothers who did not work outside the house. Since the figures are small, for comparison purposes, the χ^2 table was collapsed into working full time or part-time, and not working outside the home. The intra-group differences were not significant though the percentages suggest that more DU+GU's had mothers at home. There was no difference in this respect between the in-patients and out-patients. Significantly more of the females with ulcer ($\chi^2_1 = 4.144$, $p < .05$) had mothers at home. Goldberg, in her study of childhood duodenal ulcers, found that fewer mothers of her ulcer patients worked outside the home compared with her control group, and suggested that an over-protective relationship existed between ulcer patients and their mothers. It might be that, from our figures, this factor might operate more in the women than in the men.

Mother's Role in the Family (Table 23)

In practice the patients seemed to have no difficulty in assessing this. Answers came very readily.

The group was rated -

Mother dominant. 83, 49%.

Average. 65, 39%.

Subject to

husband. 20, 12%.

Not known and

not applicable. 10.

Half of the group, therefore, remembered the mother as the dominant figure, while only twelve per cent recollected their fathers as the definite head of the household. A significantly higher number of male patients with ulcer, more than half the group, remembered their mothers as the head of the household when they were compared with the females of the group, over half of whom thought that father and mother played equal roles ($\chi^2_2 = 8.291$, $p < .05$). This finding thus seems contradictory to that of the previous section.

Though there was a tendency for GU's to regard their mothers as dominant more often than DU's, this did not reach significance and in-patients and out-patients also showed similar findings.

Of the families where separation for any reason including death of a parent was recorded (Table 24) nine per cent had no substitute for the mother, while thirty-six per cent had no substitute for the father. In these latter cases the mother brought up the family by herself. This might, therefore, be one factor in the high recollection of the ulcer group that the mother was the dominant figure.

Somatic Illness in the Immediate Family (defined as parent and sibs) (Table 25)

One hundred and eleven (sixty-two per cent) of the group recorded their father as being healthy, 119 (sixty-seven per cent) their mother. Prolonged serious illness (> one year) was present in seventeen (ten per cent) of the fathers, and nineteen (eleven per cent) of the mothers. Prolonged

disability was found in forty-six (twenty-six per cent) of the fathers and thirty-five (twenty per cent) of the mothers. There was, therefore, no real differences between the parents in this respect. Figures for the siblings were fifty-one per cent, thirteen per cent and thirty-one per cent respectively, that is, only half the group considered their sibs to be healthy, a considerable reduction when compared with the numbers of healthy parents.

Psychiatric Illness in the Immediate Family (defined as parents and sibs) (Table 26)

Only definite psychiatric referrals and treatment-episodes were counted. Several patients suggested that their parents were 'nervous,' but the difficulty of rating this retrospective impression precluded their inclusion in this section.

Two per cent of the fathers, five per cent of the mothers and seven per cent of the sibs have been under formal psychiatric care. Further breakdown was impractical owing to the smallness of the numbers, but as in somatic illness, the suggestion is that the sibs are more 'ill' than the parents. This figure, by defining psychiatric illness as definite formal referral and treatment, must be a minimum for the group.

Education of the Patients (Table 27)

The figures for the group as a whole were:-

Primary. 76%.

Secondary. 10%.

Further education. 9%.

University. 4%.

The figures were virtually identical for both sexes, patient-status groups and for diagnostic groups. Over three quarters of the group had attained only a primary level of education. These figures suggest one reason why those patients of the ulcer group who improved on the socio-economic status

of their fathers did not achieve social class I. No conclusions can, however, be drawn from these figures as they would require to be compared with similar general population figures of the same generation as the ulcer group.

Two patients attended a special school for mental defect, one a residential school for a physical handicap (spastic), and two patients had been sent to Borstal.

Social Activities during Childhood (Table 28)

Seventy per cent of the group considered that they had been good mixers, sixteen per cent that they had been solitary children, and fourteen per cent that they had been leaders in many activities.

While the figure for DU's and DU+GU's were practically identical, only half the number of GU's compared with the other two groups considered that they had been 'leaders'. The difference was, however, not significant. Similarly, there was a tendency ($\chi^2_2 = 5.885$, $p < .10$) for the out-patients to consider themselves less frequently as leaders when they were compared with the in-patients.

Childhood Discipline of the Patients (rated by themselves) (Table 29)

Just over half the group (fifty-three per cent) recalled themselves as submissive children, one third (thirty-three per cent) thought they were the same as other children and fifteen per cent said they were frequently in trouble with authority. For the purposes of comparison, the very easy and average groups were summed, and considered against the rebellious group. No significant differences emerged.

Work Record of the Patients (Tables 30 and 31)

Two ratings were obtained for the patients to which, by definition,

this section referred, a) the pre-ulcer work record and b) the post-ulcer work record. The findings for the total group were -

<u>Pre-ulcer</u>		<u>Post-ulcer</u>	
39,	22%	Excellent	27, 15%
83,	47%	Good	61, 34%
26,	14%	Fair	50, 28%
7,	4%	Poor	21, 12%
0,	-	Bad	3, 2%
23,	13%	Not applicable	16, 9%

In the pre-ulcer group twenty-three patients (thirteen per cent) could not be rated. This group was largely made up of patients whose ulcer symptoms began before they started working, and a few, especially women, who had stayed at home and never 'worked'. Sixteen patients (nine per cent), the post ulcer-group who could not be rated, represented the number of women who never 'worked' or who had not 'worked' after marriage.

A 'good' work record comprised categories excellent and good, and a 'poor' work record categories fair, poor and bad. Under these headings sixty-nine per cent of the patients, before they suffered from ulcer dyspepsia, had a good record with steady employment, and eighteen per cent had a poor work record. These figures changed to forty-nine per cent and forty-two per cent respectively after peptic ulcer was diagnosed. It seems, therefore, that suffering from peptic ulceration quite definitely affects adversely the patient's work record.

There was no difference between the sexes, diagnostic groups, nor patient-status groups when the work record was broken down for both pre-ulcer and post ulcer. Indeed the figures were remarkably consistent. Type of ulcer and sex, therefore, did not play a part in the falling-off of the patients' work records, merely the presence of peptic ulceration.

Ambition of the Patients (Table 32)

This was a purely subjective personal rating by the patients themselves, and bore no relation to their actual achievements. Twenty-nine per cent considered themselves above average in aspiration, forty-six per cent thought they were much the same as their contemporaries, and one quarter of the patients considered that they were not ambitious at all. For comparison purposes 'average' and 'below average' were compared with the 'above average' patients. If anything DU's and DU+GU's seemed to be less ambitious than GU's (twenty-eight per cent and fifteen per cent compared with forty-three per cent) but the apparent differences did not reach significance, and there was similarly no difference between the in-patients and out-patients. There was, however, a significant sex difference, the females being less ambitious than the males ($\chi^2_1 = 4.639, p < .05$).

Adult Financial Circumstances (Table 33)

The findings in the group were as follows:-

Comfortable.	13%,
Adequate.	46%,
Marginal.	26%,
Small debts.	13%,
Large debts.	2%.

Fifty-nine per cent of the patients were, therefore, living quite well, and forty-one per cent were in some financial trouble. That almost half of the ulcer group have financial worries to a greater or lesser extent, would fit in with the findings of other studies that this is a factor in exacerbations of chronic peptic ulcer. The first two and the last three categories were combined for comparison purposes and no significant sex, diagnostic, nor patient-status differences emerged.

Age of the Patients at First Marriage (Table 34)

Nineteen patients were single (eleven per cent). Cumulative frequency curves were drawn showing the age of the patients at marriage (Diagram 35). A Kolmogorov-Smirnov one-tailed test was applied, and it was found that the women of the group were marrying younger than the males ($\chi^2_2 = 42.019$, $p < .001$, Diagram 36), as obtains in the general population. The DU curve came close to that of the whole group. It appeared as if GU's as a whole were marrying younger than DU's and DU+GU's were marrying later than DU's. These differences were, however, not significant (Kolmogorov-Smirnov Test). There was no difference between the age of marriage of DU males compared with GU males, or between the women of these groups. In addition there was no difference between DU males and DU+GU males.

The age of marrying of the general population was then considered over the length of time that the marriages of the ulcer group would have been expected to take place. The years 1938, 1948, 1955, 1959 and 1963 were selected, and cumulative frequency curves were drawn (Diagrams 37, 38, and 39). The trend between 1938 and 1963 was for younger marriages, but the curves were the same shape. It was possible, therefore, to average these populations and compare the result with the ulcer population. The difference between the two populations was significant ($\chi^2_2 = 12.171$, $p < .05$). The ulcer group was marrying younger than the "average" population. This finding, therefore, offers confirmation of similar results obtained when the ulcer population was compared with the patients of the Western General Hospital admitted during 1963 and 1964.

Marriage of the Patients

The following social variables which concerned the marriage of the patients were studied:-

- (1) Age of the patient compared with the age of the spouse (Table 40) (Diag. 40a)
- (2) Relationship with the spouse (Table 41)
- (3) Size of the families of the patients (Table 42) (Diagram 42a)
- (4) Relationship with their children (Table 43)
- (5) Second marriages in the group.

Men married women younger than themselves ($\chi^2_2 = 42.019$, $p < .001$) and the mean size of their families was 2.6. Findings similar to these would be expected in any population studied. The patients come from bigger families (mean size 5.4) and the smaller figure for their children is understandable on two accounts, a) the tendency in the general population for smaller families, and b) many of the younger people in the group had not completed their families. Two thirds of the group claimed to have a good relationship with their children. On the whole marriage was successful in this group, only eighteen per cent of marriages being recorded as poor, though only seven per cent of patients admitted to having a desire to terminate their marriages. Of marriages which had been terminated, ten ended with the death of the spouse, seven in divorce and four in legal separation. Of patients who married for a second time (nine), three declared that their second marriages were unsuccessful.

No significant differences emerged between the sexes, diagnostic groups, nor patient-status groups in these social variables.

Time Interval parted from the Spouse before the Initial Interview

This was not a factor in the patient seeking hospital help for his ulcer dyspepsia, as only one patient was admitted to hospital within a month of the death of his wife. In others, at least one year had elapsed between separation and hospital appointment. This time interval was held to be too long for it to have any relevance to the present investigation.

Assessment of the Adult Social Contacts outside the House (Table 44)

The group was rated as follows:-

Many. 13, 7%.

Average. 50, 28%.

Very few. 97, 54%.

None. 18, 10%.

In two thirds of the group there was, therefore, very little interest outside the home. This seems a high figure, but there are no available figures for comparison with other groups. In order to compare the ulcer sub-groups, many and average were grouped together, and compared with few and none. There were no significant differences between sexes, diagnostic groups, nor patient-status groups. It was remarkable, indeed, how homogeneous the ulcer groups were in this respect.

Smoking Habits of the Patients (Table 45)

By definition 157 (eighty-eight per cent) of the group were smokers, with 129 (seventy per cent) smoking at the time of the initial interview. The great majority of patients (117) were regular smokers before their twentieth birthday and 140 admitted to smoking regularly before their twenty-fifth birthday. More men than women were smokers ($\chi^2_1 = 5.020, p < .05$). There were no differences between DU's, GU's and DU+GU's in this respect, but significantly more out-patients than in-patients were smoking at the initial interview ($\chi^2_1 = 6.718, p < .01$).

The policy of the Unit is to advise all ulcer patients, if not to stop, to cut their smoking consumption drastically. A study from Oxford pointed out that smoking bore no relation to the development of a peptic ulcer, but affected the rate of healing adversely. Medical pressure on patients to stop smoking can obviously be exercised much more forcefully on patients in

bed, so that the significantly smaller number of in-patient smokers probably points to some degree of success in the Unit policy.

A similar number of DU and DU+GU males when they were compared with GU males were smokers ($\chi^2_1 = 0.635$, Yates' correction being applied).

Of the smokers:-

75% inhaled,

79% smoked cigarettes only,

1% smoked a pipe only,

9% smoked both.

The great majority of smokers, therefore, in the group under consideration smoke cigarettes.

An assessment of the amount smoked per day by the group was then made
(Table 46):-

7 patients smoked 1-4 cigarettes per day,

57 patients smoked 5-14 cigarettes per day,

46 patients smoked 15-24 cigarettes per day,

18 patients smoked 25-49 cigarettes per day,

1 patient smoked more than fifty per day.

The patients were then divided into light smokers (< 15 per day) and heavy smokers (> 15 per day). More of the men fell into the latter category, but the difference between the sexes was not significant. There were no differences also between the diagnostic and the patient-status groups.

Interest in Food (Table 47)

The group was rated as a whole:-

3% extremely interested,

22% very interested,

37% average,

37% not at all interested.

The first two groups were compared with the last two. No differences between the sub-groups emerged, and indeed it was remarkable how homogeneous the ulcer patients were.

Drinking Habits of the Patients

The patients were first rated on how often they drank alcohol (Table 48). Fourteen per cent drank every day, thirty per cent once per week, and fifty-six per cent were occasional drinkers only.

Table 49 shows that two patients drank more than a bottle of spirits per day, one drank more than half a bottle per day, and seven drank more than one bottle per week. All these patients were males.

Table 50 shows that fourteen per cent of the group drank on an average more than two pints of beer per day, while a further fifteen per cent drank seven pints per week. Again the heavy beer drinkers were entirely male.

The great majority of the patients (eighty-two per cent) were social drinkers only (Table 51). Two patients always drank alone and a further fourteen sometimes on their own. Nine per cent of the group were strict teetotalers.

An attempt was made to assess any difficulties which the group had encountered due to alcohol:-

- a) with the spouse - seventy-five per cent said they never had rows at home on account of their drinking habits, eight per cent rarely, four per cent frequently, and the remaining three per cent reported constant rows at home, and
- b) at work - two patients had lost a job on one occasion through their drinking habits, and another two had lost more than one job on this account.

The figures are too small to permit of any further breakdown, but it

can be noted that all patients referred to in this section as having had some difficulty with alcohol, are male.

Summary of Descriptive Findings

The observed differences (Table 52) in the ulcer sub-groups under discussion are :-

1. Diagnostic Group Differences

- a) The patients in whom there is present a duodenal ulcer and a gastric ulcer resemble patients with duodenal ulcers rather than patients with gastric ulcers.
- b) Relatively more women have gastric ulcers.
- c) In the study of parental loss, possibly more patients with gastric ulcers suffered than did the other two groups. Significantly more of this group of patients suffered from parental deprivation than did the other groups, and this appeared to be confined to paternal deprivation.

2. Sex Differences

- a) Women are of lower social class than the men.
- b) More women than men had mothers who did not work outside the home.
- c) More men than women remember their mothers as dominant.
- d) Women are less ambitious than the men.
- e) Fewer women smoke.
- f) Heavy drinking and trouble with alcohol is confined to the men.

3. Differences between In-patients and Out-patients

- a) Fewer in-patients smoked at the time of the initial interview.

4. Differences between the Ulcer Population and other comparable Populations

- a) More of the ulcer group come from Edinburgh than the in-patients

of the Western General Hospital during 1963 and 1964.

- b) The ulcer population differs from other Western General in-patients and the general population, in being predominantly male.
- c) The ulcer population is much older than the general population, but the male patients with ulcers are significantly younger than other in-patients admitted to the same hospital.
- d) Ulcer patients, and particularly the men, marry younger, when they are compared with other hospital in-patients.
- e) Women admitted to hospital with peptic ulcer are of lower social class than other women admitted to the same hospital.
- f) Ulcer patients are of higher social class than their fathers.
- g) The ulcer group as a whole had suffered more parental separation during childhood than had other patients referred to the same hospital.

The sub-groups studied, that is, duodenal ulcer, gastric ulcer and duodenal ulcer plus gastric ulcer, male and female, in-patient and out-patient, are on the whole remarkably homogeneous apart from these differences listed above. Some differences can be explained by circumstances (3a), and sex differences (2c,d,e,f,) might be comparable to findings in other populations.

Where comparisons are possible, the ulcer group seems remarkably like other populations with respect to the social variables studied. The outstanding difference is the sex ratio.

Peptic ulceration has resulted in deterioration in the patients' work records.

PSYCHIATRIC FINDINGS AT INITIAL INTERVIEW

Previous Psychiatric History (Tables 53 and 54)

This was defined as being present if the patient had been treated at a psychiatric hospital, either as an in-patient or out-patient, or had gone to his general practitioner complaining of his 'nerves'. Under this definition thirty-six patients (20.2%) were classified as 'nervous'. More women than men were 'nervous' (thirty-three per cent of the women as compared with sixteen per cent of the men). The difference was significant ($\chi^2_1 = 6.414$, $p < .01$), so that this represented either a real difference in psychiatric morbidity or the women complained more readily.

Twenty-four per cent of the out-patients were thus classified and eighteen per cent of the in-patients. This difference did not reach significance ($\chi^2_1 = 0.890$).

Though the percentage of GU's (twenty-nine per cent) with a previous psychiatric history was higher than in DU's (twenty-three per cent) or DU+GU's (fifteen per cent), no significant differences emerged when the groups were compared.

GU's compared with DU and DU+GU; $\chi^2_1 (2) = 1.435$.

DU's compared with DU+GU's; $\chi^2_2 (1) = 1.101$.

Of the in-patients, thirty-one per cent of the DU's, twenty-nine per cent of GU's and no DU+GU were known to be nervous. When the out-patient group was similarly broken down the figures were twenty-one per cent DU's, twenty-nine per cent GU's and sixty-six per cent DU+GU's. Numbers were too small to permit comparison of the groups within patient-status groups.

Thus in respect of previous psychiatric illness the group as a whole showed a significant difference only between the sexes. These calculations are of course based on the number of persons complaining, with no attempt at diagnosis. The figures show that the amount of psychiatric illness was

similar but cannot tell us whether the groups suffered from the same or different illnesses.

Psychiatric Illness at Initial Interview (Tables 55 and 56)

The group as a whole was first rated as previously described into those with psychiatric symptoms, and those without psychiatric symptoms. One hundred and twenty-two (sixty-nine per cent) had symptoms. No attempt was made to rate the severity of the symptoms.

More of the women (seventy-eight per cent) had symptoms than the men (sixty-three per cent) but the difference did not reach significance ($\chi^2_1 = 2.384$).

When the out-patients were compared with the in-patients the difference was not significant ($\chi^2_1 = 1.052$).

More GU's than DU's had symptoms (eighty-six per cent compared with sixty-five per cent respectively). When these groups were compared, the gastric ulcer group was found to contain a significantly higher proportion of people with symptoms. (GU's compared with DU's and DU+GU's; $\chi^2_1 (2) = 4.545$, $p < .05$). There was no significant difference between DU's and DU+GU's ($\chi^2_1 (1) = 1.100$).

The difference thus lay between patients with gastric ulcers and the others.

Table 57 depicts the psychiatric diagnoses for the group. Of the total group, therefore, forty-eight (twenty-seven per cent) were depressed, forty-one (24.7 per cent) showed anxiety symptoms, thirty (seventeen per cent) were diagnosed as having character disorder only, one patient was suffering from an organic psychosis and two patients from non-organic psychoses.

Only the three most commonly occurring groups, depression, anxiety and character disorder, were then considered, and the diagnoses in DU's, GU's and DU+GU's depicted (Table 58). While depression and anxiety were diagnosed with the same frequency (twenty-four per cent and twenty-six per cent respectively)

in DU's, more GU's presented with depression than anxiety (forty-three per cent depressed, compared with eighteen per cent with anxiety). The DU+GU group behaved as DU's. Character disorder only was higher in GU's (twenty-five per cent) than in the other two groups (fifteen per cent and seventeen per cent).

Discounting the patients without symptoms and the three patients suffering from a psychosis, the following figures were obtained for the groups when the percentages were calculated on the total in each group with the most commonly occurring symptoms, that is, eighty-six DU's, twenty-four GU's and nine DU+GU's. Fifty per cent GU's compared with thirty-eight per cent DU's and thirty-three per cent DU+GU's were depressed, twenty-one per cent GU's compared with thirty-seven per cent DU's and forty-four per cent DU+GU's were anxious, and twenty-nine per cent GU's compared with twenty-four per cent DU's and twenty-two per cent DU+GU's had character disorder only. The difference did not, however, reach significance, when DU's and DU+GU's were compared with GU's ($\chi^2_2 = 2.493$, Table 59) so clinically it can remain at suggestion level only that patients with gastric ulcer are more likely to present with depression and patients with duodenal ulcer with anxiety.

Character disorder was diagnosed in two sets of patients, a) those with character disorder only, and b) those in whom the interviewer considered that neurotic symptoms were present, but that they had occurred on the basis of a character disorder. Ninety-nine patients were thus diagnosed as having character disorder, that is, fifty-four per cent DU's, fifty-seven per cent GU's and sixty-nine per cent DU+GU's. These differences were not significant (Table 60).

Tables 61 and 62 show the type of character disorder present in each ulcer category, and in the total group. In each group only those patients with character disorder were considered, and it was noted that slightly more GU's (fifty-three per cent) and DU+GU's (sixty-seven per cent) were thought

to be immature when compared with the figure of forty-five per cent for DU's. More DU's (eleven per cent) were considered schizoid than GU's (six per cent). The category 'other', which in the majority of cases is obsessive personality, occurs more frequently in DU's (twenty per cent) than GU's (seven per cent), with DU+GU's falling in the middle (eleven per cent). Psychopaths were distributed evenly throughout the groups (twenty-four per cent, twenty-seven per cent, and twenty-two per cent).

The ulcer groups were compared for overloading of one of the groups with a particular character disorder, namely immaturity, schizoid and obsessional personalities, and psychopaths.

Immaturity

DU and DU+GU versus GU; $\chi^2_1 (1) = 0.461$.

DU versus DU+GU; $\chi^2_1 (2) = 1.565$.

Obsessional personality

DU and DU+GU versus GU; $\chi^2_1 (1) = 0.02$.

Schizoid personality

DU and DU+GU versus GU; $\chi^2_1 (1) = 1.601$.

DU versus DU+GU; $\chi^2_1 (2) = 0.473$.

Psychopaths

DU and DU+GU versus GU; $\chi^2_1 (1) = 1.826$.

DU versus DU+GU; $\chi^2_1 (2) = 0.021$.

No differences could be found.

Only one significant finding emerged:- the diagnosis of immaturity was made more frequently in the women (eighty-two per cent) than in the men (thirty-five per cent). $\chi^2_1 = 19.636$, $p < .001$.

Summary of Clinical Psychiatric Findings at Initial Interview

1. More women than men have a previous history of psychiatric trouble.

2. Among patients with gastric ulcer there is more current psychiatric illness.
3. Diagnostic breakdown yielded the suggestion that gastric ulcer patients were more frequently depressed and less frequently anxious than the rest.
4. No difference was observed between the groups in respect of personality disorder diagnosed in these patients.
5. More of the women than the men were immature.

Care should be taken not to claim that this last finding is specific to peptic ulcer as it could be true of any group of psychiatric patients.

Questionnaire Scores at Initial Interview

A summary of the findings of the questionnaire which was given to 177 patients at the end of the initial interview is given in Table 63 with the comparisons which show significant difference between the groups. The Kolmogorov-Smirnov Test was used for these comparisons.

DU'S, GU'S and DU+GU'S score similarly in the questionnaire except for n. Counteraction, where DU'S score higher than GU'S ($\chi^2_2 = 6.946, p < .05$).

This can be compared with the clinical findings that, where differences were present, they occurred between DU'S and GU'S, but from the point of view of diagnosis of psychiatric morbidity the groups were similar.

Differences appeared on three items only when patients who had been diagnosed as having psychiatric symptoms were compared with patients without psychiatric symptoms. "Psychiatric" patients scored significantly higher on Anxiety ($p < .001$), and Psychasthenia ($p < .001$), and lower on Endurance ($p < .05$).

No differences emerged when DU'S, GU'S and DU+GU'S without psychiatric symptoms were compared, and few differences when the patients in these sub-groups with psychiatric symptoms were compared. (DU'S with symptoms scored higher on Counteraction ($p < .05$) than GU'S with symptoms). This ties in with the clinical finding that the type of psychiatric symptomatology diagnosed

did not differ between the groups.

Comparing DU's with psychiatric symptoms with DU's without psychiatric symptoms, the "psychiatric" duodenal ulcer patients scored significantly higher on Anxiety ($p < .001$), on Psychasthenia ($p < .001$), and lower on Succourance ($p < .01$). This was apparent also in DU+GU's but did not occur in GU's.

Comparing ulcer groups who had been diagnosed as suffering from depression, anxiety and character disorder only, very few differences emerged, reinforcing further the clinical assessment of the group.

The questionnaire thus proved to be a useful check on the clinical diagnosis at the initial interview. It further showed that "psychiatric" patients score significantly higher on anxiety than do "non-psychiatric" patients, and thus affords two ways of looking at the same group of patients, that is, those with psychiatric symptoms, and those with high anxiety are largely the same group.

CHAPTER 5

THE METHOD OF THE FOLLOW-UP

(Material relevant to this chapter comprises Appendix V)

METHOD OF THE FOLLOW-UP OF THE ULCER PATIENTS

Introduction

Factors which influenced the design of the follow-up, and their final incorporation in its format have been discussed.

In this chapter it is proposed to enumerate the methods by which the design was transferred into action.

Summary of the Follow-up

All patients who had been seen at the initial interview and diagnosed as suffering from peptic ulcer were followed up at six-monthly intervals over three years (178 patients). During the course of the follow-up four patients died from causes unrelated to peptic ulceration; three from carcinoma at sites other than the stomach, and one as a result of chronic congestive heart failure following nephritis.

Ninety-eight patients were operated on in a definitive effort to cure their ulcers.

Every six months the patients were assessed on their physical and psychiatric progress.

Definitions

It is necessary at this stage to define the terms which are going to be used in the follow-up of the patients.

Duodenal Ulcer Patients This is the group of patients in whom active peptic ulceration of the duodenum has been demonstrated. Included in this group are the patients in whom there co-exists either an ulcer crater or evidence of previous duodenal ulceration and a secondary gastric ulcer. It has been shown in the results of the initial interview that those patients closely resemble duodenal ulcers. Clinically also these patients

behave as duodenal ulcers (for example, with respect to gastric function).

Gastric Ulcer Patients The group of patients in whom active primary peptic ulceration of the stomach has been demonstrated. The results of the initial data showed many points of similarity between these ulcer groups, so that in many instances they can be combined as "the ulcer group", but where differences might be expected to emerge they will be considered separately.

Surgical Patients All patients in the survey who had been operated on for peptic ulceration in the three years of follow-up. These were divided into initial - those who by the end of the first six months of entering the survey had undergone surgery, and subsequent - those who came to operation within the next two and a half years. Though information was available on which type of operation was carried out, it is not proposed to consider the results of operation under the headings of the type of procedure, for example, gastrectomy, gastroenterostomy, as a) the numbers for each type are small, and b) to the patient the important fact is that operation has been carried out, and he is not concerned with the niceties of surgical technique.

A problem was encountered with simple closure of perforation. This was undertaken on an emergency basis, without the careful decision to operate or not which obtained in the "cold cases". In the end it was decided to include these patients in the surgical group, as again so far as the patient was concerned an operation had been carried out for relief of ulcer symptoms. In the event this concerned only two cases, one of whom in the time interval of the survey had an elective operation for relief of ulcer dyspepsia.

Medical Patients This group included all the other patients whether

they had received a course of in-patient medical treatment during the time span of the survey, or had continued as out-patients of the Gastro-Intestinal Clinic, or after assessment had been returned to the care of their General Practitioner.

Contact with the Patient Contact with the patient was defined as having been made, if either he had attended the follow-up clinic, had been interviewed by other of the means employed to see him, or if he had answered the written questionnaire.

Psychiatric Patients The group of patients in whom, at initial interview the interviewer considered that psychiatric symptoms were present. None of these patients in the sense of being referred to a Psychiatric Out-patient Clinic are "psychiatric", but they were diagnosed as having symptoms using exactly the same criteria as would obtain at a clinic for Nervous and Mental Disease. Symptoms were present at all grades of severity from mild to severe disability, but in this survey a "severity" rating was not made.

Non-Psychiatric Patients All those patients in whom no psychiatric symptoms were found at initial interview.

Finding the Patients

At the initial interview the patients had been asked if they were willing to attend a follow-up clinic at the Western General Hospital once every six months, and all signified their willingness. A register was kept detailing the month in which each patient entered the survey. At the beginning of each month a letter was sent to those patients who had entered their sixth month after the initial interview, giving them a date and time for their clinic attendance, and requesting that, should this not

be suitable they might get in touch with the hospital when an alternative date would be suggested. The interviews were conducted by the investigator. It was realised, at the outset of the investigation, that in order to have the follow-up as complete as possible, clinic times would have to be very 'elastic' and every effort was made to accommodate the patient's preference for a particular time, for example, clinics were held in the evenings for the working population to avoid loss of time at work, and on Saturday mornings, when it was found that many mothers of young children liked to come. If there was no response to the initial letter, a second and finally a third letter was sent out at weekly intervals. In practice it was found that the response to the third letter was very small, so no further attempt was made on that occasion to try to persuade the patient to come to the hospital. Instead, one week later a written questionnaire with a stamped addressed envelope was sent to those patients who had not responded. A similar process was repeated every six months for three years so that each patient, excluding the initial interview, could be seen on up to six occasions. In practice it was found that the six-monthly interval could not be rigidly adhered to. In a proportion of cases letters were returned marked "gone away". These necessitated correspondence with their last known practitioner, the Executive Council, the Labour Exchange or the Edinburgh Corporation Housing Department, in an effort to find the patient's new address. Occasionally, therefore, the patients were "late" in being seen but it was felt advisable to continue the practice, and accept that, for example, the one-year follow-up might include cases seen between eleven to thirteen months after the initial interview. Various other methods were used to find patients; the out-patient clinic lists for the Western General Hospital were scanned at the beginning of every week to see if

a survey patient was due to attend another clinic, and arrangements were made to see him after his clinic attendance, and the Gastro-Intestinal Unit's policy of conducting post-operative gastric secretion tests on a Monday morning in the hospital proved to be a useful source of some missing patients. "Hard to find patients" were thus seized at any available opportunity and counted into the nearest follow-up. Patients who went abroad kept in touch by letter.

Attendance at the clinic fell with length of time from the initial interview; eighty-one per cent at Contact 1 falling to sixty-six per cent at Contact V; though the questionnaire response rose from eight per cent at Contact 1 to sixteen per cent at Contact V.

The group of patients, from whom no response was obtained, after an initial figure of eight per cent, that is, six months after their first contact with the Gastro-Intestinal Unit remained constant at fourteen to sixteen per cent of the total group.

On each occasion of contact information was available on ninety per cent (I), eighty-four per cent (II, III, IV), and eighty-two per cent (V) of the total group.

The Interview

The interview, insofar as it was possible followed a set pattern. This was made comparatively easy because all interviews were conducted by the same person. Answers to the questions were entered on a five page schedule, and thus the same information was available on all the patients. Copies of the follow-up schedule and of the questionnaire, which was a shortened version of the former, are included in Appendix V.

1) Follow-up data The particular follow-up was recorded, the patient's name, case number, how he had been contacted, and how easy it had been to find him.

2) Physical treatment and progress Information whether in the previous six months the patient had had surgical treatment, medical in-patient treatment, had been carried on an out-patient basis by the Gastro-Intestinal clinician, or after assessment at the hospital had been returned to the care of his general practitioner, was noted. If operation had been carried out, the indications for operation, and which particular operation, were detailed, and in subsequent interviews what post-operative course had been followed, whether a second operation was required, or a further course of in-patient treatment. The incidents of treatment in the other patients were also noted. A section dealt with the use of the hospital services by this particular group of patients, either as an in-patient or out-patient, with details of the clinical findings in each case.

Under this heading it seems reasonable to discuss how the patients were rated for both operative and medical outcome, because depending on this came the decision which information it was necessary to record on the schedule. The help of Mr. W. P. Small, surgeon at the Gastro-Intestinal Unit, was invaluable with the surgical cases. Since operation had been planned to relieve ulcer symptoms it seemed reasonable to assess outcome on success in obtaining relief.

However, new symptoms arise as a result of operation, post prandial dumping, bilious vomiting, post vagotomy diarrhoea, and weight loss being among the most frequent, so consideration of these had to be included in the assessment. Another factor in the assessment, though not strictly under the heading of symptoms, was included, namely details of the post-operative work record where applicable, because consideration of this featured in the decision to operate. The following were therefore recorded for each patient who had been operated on:

- a) presence or absence of abdominal pain and a detailed description if present;

- b) eating habits compared with those obtaining pre-operatively, for example, diet followed, amount at one time that the patient could eat comfortably;
- c) vomiting - frequency, precipitating factors, amount and type of vomitus;
- d) nausea - frequency, precipitating factors, method of obtaining relief;
- e) diarrhoea - presence or absence, frequency, nature of the stool, method of obtaining relief;
- f) dumping - presence or absence, precipitating factors, duration of symptoms, assessment of severity of disability;
- g) patient's weight compared with his pre-operative weight;
- h) work record after operation;
- i) any other symptoms present, for example, halitosis, heartburn, dysphagia, ventral hernia.

Visick and Pulvertaft had used a rating scale in their twenty-year follow-up of operations for peptic ulcer in York based on the above considerations, and it seemed reasonable to use the same scale. Patients were rated one to five according to residual symptoms present.

1. No symptoms
2. Mild symptoms easily controlled, for example, mild dumping which was suppressed by the patient's adjusting his eating habits slightly.
3. Mild symptoms not controlled - satisfactory, for example, episodes of bilious vomiting at regular intervals, but the patient denied any real disability from this.
4. Mild symptoms not controlled - unsatisfactory, for example, the patient suffered from residual symptoms severe enough to restrict his life, and in some instances suggested that he had been better off

with his ulcer.

5. Not improved, for example recurrence of ulcer after surgery, readmission to hospital on account of residual symptoms, or a second definitive operation was necessary.

Patients in groups one and two were considered to be good surgical results, group three were moderate results of surgery, and groups four and five comprised the bad results.

As each six months follow-up was completed, the survey number of the patient, date and type of operation, date of interview, and information on residual symptoms as described, was given to Mr. Small, who thus independently assessed the physical outcome of operation without seeing the patient or having any means of identifying a particular patient. His rating was subsequently entered on the patient's schedule.

In the non-operated group it was decided for rating purposes to take advantage of the fact that this was a chronic ulcer population, with an average length of history before entering the survey of 12.4 years.

At each interview they were asked :-

- a) number of episodes of ulcer dyspepsia in last six months,
- b) duration of symptoms,
- c) details of symptoms,
- d) presence of new symptoms, for example, bleeding, obstructive vomiting,
- e) whether they had had a worse, better, or much-as-expected six months,
- f) loss of work during the previous six months due to ulcer symptoms.

This was compared with findings recorded at the previous six months, and assessment made by the interviewer. This proved surprisingly easy, and the patient's assessment of their own cases very accurate. They were rated on a scale one to five according to degree of severity of

their ulcer symptoms as compared with symptoms assessed by the physicians at their initial interview or on admission to hospital.

1. No symptoms.
2. Symptoms better.
3. No change in symptoms.
4. Symptoms worse.
5. Admission to hospital on account of ulcer symptoms.

Groups one and two were considered improved, group three unchanged, while groups four and five were rated worse.

These three categories of outcome of medical treatment were thus the medical equivalents of good, moderate and bad results of surgery.

3) Work Record Surgical patients were asked when they returned to work, and in all cases it was noted whether they had changed employment in the previous six months. If a change had taken place, it was rated for a better, worse or similar job. Job rating was done by the interviewer after considering the financial aspect, working hours, prospects of promotion, whether promotion had occurred in the change of job. This left a group of patients, mainly housewives with a few retired patients, for whom an 'activity' assessment was made, comparisons being made between six-monthly intervals. It was realised that this was not such a satisfactory method of assessment as obtained with the working population.

4) Alcohol Consumption For all patients change in frequency and type of drinking habits was recorded, with the patient's account of the actual amount drunk in a week. Any change in the effect alcohol had on the patient was noted.

5) Smoking Habits The patients were asked the number of cigarettes smoked compared with the previous six months, and if their smoking habits had changed, the reason for the change.

6) Psychiatric Progress and Treatment The patients were asked in detail about any psychiatric symptoms present and these were recorded in full. New symptoms were enquired into, whether the patient thought operation had had any effect in this respect, and whether he had had treatment for his "nerves" in the previous six months. Details of treatment were entered on the schedule. The psychiatric diagnosis at the time of interview was entered, using the same criteria of diagnosis as at the initial interview. The interviewer then assessed the psychiatric progress, after comparison with the symptoms recorded at the initial interview. The patients were rated one to five according to the severity of the psychiatric symptoms.

1. Symptoms gone.
2. Symptoms better.
3. No change in symptoms.
4. Symptoms worse.
5. New symptoms, that is, psychiatric symptoms which developed during the course of the survey in patients who had been recorded as having no psychiatric symptoms at initial interview.

Groups one and two were considered improved, group three unchanged, and groups four and five worse.

Thus the psychiatric progress of the patients was assessed in three groups comparable to the physical assessments after medical and surgical treatment. Provision was also made in the schedule to detail those patients who never had psychiatric symptoms during the time of the survey, and also the progress in the group of patients who developed new symptoms.

After the schedule was completed, the formal interview was at an end but most of the patients liked to discuss their symptoms in some more detail.

Many evinced interest in the research project and wanted to know how it was progressing. In some cases where the physical result of operation was manifestly unsatisfactory or ulcer symptoms increasing, though the patient knew that his attendance was for assessment only, he was obviously hoping that treatment would be forthcoming. In these cases, or if the interviewer felt that the medical needs of the patient made imperative a clinical opinion (for example, when one patient attended with a three-week history of severe obstructive vomiting, and was obviously ill and dehydrated at interview,) referral to the Gastro-Intestinal Clinic was made, with a letter to the general practitioner explaining the circumstances. Occasionally patients attended the follow-up clinic with a letter from their general practitioner asking for advice in treatment, and these also were referred to the Gastro-Intestinal Clinic. Time of Interview was approximately half an hour.

Subsequent Steps

Immediately after the interview, or as convenient at the end of a clinic, the patient schedules were coded. When each six-month follow-up was completed, and the surgical assessment of outcome obtained, information was transferred to Hollerith punch cards, each patient over the three-year span of the survey having six cards. The cards were then stored.

Observations as the Survey Continued

1) As the survey proceeded, it was noted that the missing patients, apart from a small "hard core" who practically never attended, varied from follow-up to follow-up, and for a variety of reasons; these ranged from change of address, where it was not the fault of the patient that he was listed as missing, to sudden feelings that the hospital, having tried so hard to get him on previous occasions, deserved a visit on this one. This last

unexpected finding justified the procedure detailed above being carried out on each patient whether or not a response had been forthcoming before. Also, by keeping the procedure for finding the patients constant, comparisons between the follow-ups could be made.

2) During the course of the survey the interviewer found that some patients, who had already been followed up at six-monthly intervals, were being formally referred for psychiatric assessment and treatment by the staff at the Gastro-Intestinal Unit. These patients, whose ulcer treatment programme had already been decided upon, quite independently of any psychiatric assessment, attended a Psychiatric Out-Patient Clinic at the Western General Hospital for treatment, and this was noted in their schedules which were completed as before at the intervals previously decided upon. They were not removed from the survey.

3) As the two and a half year interviews were nearing completion, the interviewer became increasingly concerned with the question of the missing group, and also with the problem of changing the policy of finding the patients at this late stage in the survey. It was decided, in order to overcome both difficulties, to consider the results up to the end of the two and a half year follow-up, and to do this while the third year follow-up was in course of completion. This, it was hoped, would enable us to see whether the patient's position had stabilised at this interval of time. The third follow-up, when completed, could thus be considered separately to see if any further useful information had been gained by extending the survey to three years. During the third year follow-up, therefore, a similar procedure was followed asking the patients to attend the hospital, but if this failed a home interview was arranged. These were carried out by a final-phase medical student who assisted the interviewer for six weeks. He attended a typical follow-up clinic to

see how the interviews were conducted, thereafter filled in the schedule himself. Coding and assessment of psychiatric progress were, as before, done by the interviewer. The student also was given a list of missing patients, with instructions to use any available source to find them. He asked neighbours, consulted general practitioner lists, the Executive Council, the Labour Exchange, made calls at previous known places of employment; in general followed any possible lead. A strenuous endeavour was, therefore, made to make the final follow-up as complete as possible.

At the third year follow-up 121 patients (sixty-eight per cent) attended the clinic. Information was available on a further thirty-eight patients (twenty-one per cent) through the questionnaire and home visit, and one patient was seen in the ward to which she had been re-admitted at the time of interview.

Thus of the original 178 patients, 160 (ninety per cent) had been contacted, four were dead, twelve (seven per cent) were missing, and the remaining two refused to give information. The contact figure of ninety per cent thus equals the figure obtained at six months after the initial interview, and the missing group has been halved, compared with the same group at the previous contact.

Processing of the data

The procedure was exactly the same as was carried out with the data obtained at the initial interview, that is, processing of the data was carried out by the Atlas Computer at Chilton.

CHAPTER 6

THE RESULTS OF THE FOLLOW-UP

(The tables relevant to this chapter comprise Appendix VI)

RESULTS OF THE FOLLOW-UP

Results will be analysed, firstly, over two and a half years, and secondly, the third year follow-up will be considered separately.

In the consideration of the results attention will be directed to

- a) general composition of the follow-up group, and how this compares with the group of patients examined at initial interview,
- b) progress of the group in respect of physical and psychiatric symptoms to seek relationships between psychological factors and outcome of treatment.
- c) analysis of physical and psychiatric progress in the individual with the same aim as in (b),
- d) analysis of the group in respect of work record, drinking and smoking habits.

As before, the following abbreviations will be used in this chapter :-

DU = patient with a duodenal ulcer.

GU = patient with a gastric ulcer.

COMPOSITION OF THE FOLLOW-UP GROUP

On each occasion, of the total group, information was available on ninety per cent, eighty-four per cent, eighty-four per cent, eighty-four per cent, eighty-two per cent of the patients (Table 1)

Sex Differences (Table 2)

On three occasions a higher percentage of women came to the clinic, and on all occasions except the first a higher percentage of women responded to the questionnaire. Apart from the middle attendance, where the position seemed to be reversed but the difference was not significant ($\chi^2 = 1.315$) the tendency was for information to be available on a higher proportion of females than of males. The difference attained significance only once,

on the second occasion ($\chi^2 = 5.486$, $p < .02$).

Site of Ulcer Differences (Table 3)

When the group was divided according to site of ulcer, the tendency was for information to be available on a higher percentage of GU's when compared with DU's. This did not attain significance, and can be readily accounted for, as a relatively larger number of GU's than DU's happened to be admitted to the ward at the time of interview - four times as many on two occasions, and twice as many on one occasion.

Treatment Group Differences (Table 4)

Information was available on more surgically treated than medically treated patients, but the differences were not significant.

There was relatively little difference, therefore, in the composition of the group on whom information was available at each contact with the hospital, though possibly a woman with gastric ulcer who had been operated upon might, in this context, be the ideal follow-up patient.

The follow-up group consists of a high proportion of patients with the group not over-represented in one particular aspect, that is, it is a fair sample of the original group. These findings make comparisons between the patients at initial interview and at subsequent contacts feasible, and the same is true for the various subgroups.

PHYSICAL AND PSYCHIATRIC OUTCOME IN THE TREATMENT GROUPS

Physical Outcome in the Surgical Group

Of the 178 patients comprising the total group, eighty-three (forty-seven per cent) had been operated on by the end of the first six months (initial group), and by the end of two and a half years ninety-eight (fifty-five per cent) had had surgical treatment, that is, almost half of the ulcer patients who were referred to hospital came to surgery initially. Fifty-four per cent of these underwent partial gastrectomy with or without vagotomy (Table 5). Four patients had a second operation in the course of the survey, in three cases a second definitive attempt to effect surgical cure of their ulcer symptoms. These were initially counted as failure of their first operation and their subsequent progress assessed on the second operation. In the fourth case closure of perforation (which brought him into the surgical group) was followed a year later by a definitive operation, gastroenterostomy and vagotomy, and his subsequent progress assessed on the results of the operation. There were no operative deaths.

The indications for operation are given in Table 6. Case records were scrutinised for the compiling of the table, and the patients divided in the same way as Thoroughman's surgical group of male duodenal ulcer patients. "Intractable ulcers", using his terminology, are those patients who had failed to respond to a medical regime and whose main indication for operation was pain. No complications, for example, stenosis, were present in these patients. In two thirds of the ulcer group operation was carried out for relief of pain only. Of the complications, the commonest was pyloric stenosis, present in almost a quarter of the patients operated on.

The results of surgery are given in Table 7. With length of time the group who were free of symptoms (group 1), fell from fifty-five per cent to thirty-seven per cent; the group with mild symptoms who found that these were easily controlled (2), stayed fairly constant between twenty-three per cent and thirty-one per cent. The group who continued to have symptoms, but whose results of operation were considered to be satisfactory (3), varied from an initial figure of one per cent six months after operation, to between four per cent and thirteen per cent. Those who had residual symptoms which were severe enough to restrict their lives, that is, whose operative outcome was unsatisfactory (4), ranged from two per cent to seven per cent. The "not improved" group (5) rose with time, from four per cent initially, to eight per cent of the total group at the end of two and a half years.

The missing patients varied between eleven per cent and eighteen per cent, staying much the same at each contact until the last one when the highest figure was obtained. This group varied in composition with each contact. Every patient was seen at least once during the follow-up, with the result that an assessment of outcome of operation was available at some stage on each patient.

Groups 1 and 2 were rated as a good surgical result, 3 as a moderate result, in which it was clearly seen that symptoms were present but to such a degree as to be accepted as moderately satisfactory by the surgeon, and 4 and 5 were bad results of surgery. Either the ulcer symptoms recurred or the results of operation were as bad as or worse than the patient's pre-operative ulcer symptoms. The outcome in respect of these ratings is given in Table 8. In this table the missing patients were excluded. After an initial high figure of ninety-one per cent the tendency is for good results to fluctuate with time since operation, but on the whole this

group decreases, reaching a figure of seventy-four per cent two and a half years after the beginning of the follow-up. Moderate results, after a very small figure of one per cent fluctuate between five per cent and fifteen per cent. Bad results increased with time, rising from eight per cent at the first contact to eighteen per cent at the fifth contact. Certainly some of the group will not have been followed up for a full two and a half years (the subsequently operated group) but the numbers are small compared with the number of patients who comprise the initial group (84.7 per cent).

Sex and Outcome of Operation (Tables 9 and 10)

Assessment was possible only on 'contacts' so in these tables the missing patients were excluded and percentages calculated on the basis of the known group at each contact.

Table 11 shows the males compared with the females, divided into good, moderate, and bad results, and in Diagram 11a this is depicted graphically. There are proportionately more good results in the males. Apart from an initial figure of ninety-two per cent, good results in the males approximate eighty per cent. The picture is less regular in the females, where there is a steady fall from eighty-seven per cent to sixty per cent over the first three contacts, a rise on the fourth to seventy-nine per cent, and a final figure of fifty-eight per cent. It is difficult to make comparisons on the percentage figures, as fewer women were operated on than men. Two by two contingency tables were, therefore, constructed comparing the good results for both sexes against the others. On no occasion did the differences reach significance ($\chi^2 = .006, .285, .005, 2.250$). The moderate group shows a preponderance of males apart from contact III when they almost reached equality.

The proportion of women patients who fell into the 'bad' result category was more than twice as great as the corresponding proportion

of male patients. Two by two tables were again constructed, plotting the bad results against the others for each sex. On two contacts (III and V) the differences reached the level of significance ($p < .05$, $p < .01$), and on contact I reached the level of ten per cent significance. The numbers are small, especially for women, but it does suggest that there is a sex difference in physical outcome, the females tending to do less well than the men, with a significantly higher number of females having bad results of surgery.

Site of Ulcer and Outcome of Surgery

Table 12 shows good, moderate, and bad results in DU's and GU's and in Diagram 12a this is depicted graphically. As in the previous section the percentages were calculated on the basis of the known group at each contact. The number of gastric ulcers is small (twelve being operated on in two and a half years), so that conclusions cannot be too dogmatic. For DU's, after an initial high figure of ninety-four per cent, the percentage of good surgical results settles between seventy and eighty per cent with no very definite fall off with time. Until the last review when the figure of sixty-seven per cent good results is shown, good results in GU's increase with time. There are always more DU's than GU's in the moderate group, until the last contact when the positions are reversed. On the first three occasions a considerably higher percentage of GU's have had operative results; this is reversed in contact IV, and they are similar in the last contact. Possibly, therefore, the gastric ulcer patients get off to a 'slow start' after surgery. Two by two tables show no significant differences in the good results. It seems, therefore, that after an initial stage when GU's do less well, the results of surgery are not dependent on the type of ulcer, and that it is possible to combine them as the operated group.

Indications for surgery and outcome (Tables 13, 14, and 15).

Contacts only were assessed, duodenal ulcer and gastric ulcer were considered together, and indications condensed to operation for complications (C) and operation for intractability (I). Apart from occasion IV when the figures were the same, patients in whom complications were present did better, and the same findings obtained in the moderate results. More of the bad results came from the group who had been operated on for pain only. (Table 16)

It has been previously noted that good results fall off with time, but when the groups are divided into good, moderate, bad, according to indications for operation (Diagram 17), it appears that this fall off is largely coming from the intractable group. Similarly, when the bad results are considered, more of these come from the intractable group, and this rises gradually with time while, though bad results are present in the complications group, this number remains relatively constant.

Two by two tables comparing good results against moderate and bad, show no significant differences between the groups except on contact V ($\chi^2 = 9.045, p < .01$).

Straight lines were fitted to the data -

Complications: $\hat{\beta} = - .008 + 0.067$ (95% confidence interval).

Intractables: $\hat{\beta} = - .049 + .096$ (95% confidence interval).

Clearly neither of these slopes differs significantly from zero, though the maximum likelihood estimate for the intractables slopes more steeply downwards than the maximum likelihood estimate for complications.

The hypothesis that patients, in whom a pressing reason for operation (that is, for complications) do better, remains, therefore, at the suggestion level. Only at the last contact were significantly more of these patients rated as showing a favourable outcome.

Physical Outcome in the Medical Group (Table 18)

Medically treated patients comprised just over half the total group at the outset (ninety-five patients) diminishing to eighty patients by the end of two and a half years, as more of this group were operated on, and four of this group died. Though, unlike the surgical patients, this group does not have a definite starting point for assessment of results, the progress of their symptoms was assessed at intervals over two and a half years, and compared with the situation at the initial interview. Table 19 depicts the physical progress of the known patients at each contact.

The number of patients (Group 1) who were completely symptom free rose steadily over two and a half years (fourteen per cent at contact 1: twenty-four per cent at contact V). Patients who still had symptoms but were considered to be definitely better (2), after an initial figure of fifty-three per cent, ranged between forty-three per cent and thirty-nine per cent. This high initial figure, that is, nearest to the first contact with the hospital, is possibly a reflection of the "panacea" effect of referral to hospital. Many patients stressed the reassurance obtained from the visit to the "specialist" with the concomitant thorough physical examination and battery of tests. Patients whose symptoms persisted unchanged (3) fluctuated within a limited range; twenty-two per cent (1); twenty-seven per cent (II); thirty-four per cent (III); twenty-nine per cent (IV); twenty-four per cent (V). Those whose symptoms worsened (4) showed a very slight increase over the years (nine per cent at contact 1; twelve per cent at contact V). Patients who required readmission to hospital for further medical treatment (5) varied between one per cent and three per cent.

When the patients were divided into improved (groups 1 and 2), unchanged (3) and worse (4 and 5), the following figures were obtained:-

Improved: 69% (1); 61% (II); 52% (III); 57% (IV); 63% (V).

Unchanged: 22%; 27%; 43%; 29%; 24%.

Worse: 10%; 12%; 15%; 14%; 12%.

Patients who improved fell steadily till contact III, and then rose until the figure at contact V was just less than the figure at the initial contact. The proportion of patients who remained unchanged rose till contact III, and then fell again until it was practically the same as at the initial interview, while a small fluctuating increase was noted in the proportion of patients who became worse. This last figure is obviously artificially low, as the worst people are being converted to the operated group. Taking the eleven patients who underwent operation as failures of medical treatment, nineteen patients at contact V is a more realistic figure for this group than the eight recorded here.

Physical outcome in the medical group is thus a fluctuating one which fits in with the known clinical course of the disease once it has become chronic.

Psychiatric Progress over Two and a Half Years

As in consideration of physical progress, percentages were calculated on the known patients at each contact. (Table 20)

Progress in Patients who had been free of Psychiatric symptoms at Initial Interview

There is little change in this group over the time span under consideration; twenty-eight per cent at contact 1; twenty-six per cent at contact V. At every contact the surgical group, compared with the medical group, contains a higher proportion of patients who had no

psychiatric symptoms initially, and who did not develop any in the course of the follow-up; (surgical group ranges between twenty-seven per cent and thirty-two per cent; medical group, twenty-one per cent and twenty-six per cent). However, when the treatment groups are compared for patients without psychiatric symptoms against the others, the differences do not reach significance; $\chi^2 = 0.5163$ (I); $\chi^2 = 1.800$ (II); $\chi^2 = 2.4065$ (III); $\chi^2 = 1.252$ (IV); $\chi^2 = 0.8021$ (V).

Thus neither treatment group is overloaded with patients with psychiatric symptoms, and the suggestion is made that the presence or absence of psychiatric symptoms before treatment does not play a significant role in the clinical decision for surgery.

Progress in Patients who were known to have Psychiatric Symptoms before Treatment

A small percentage of the group becomes symptom free (group 1) within six months, and this percentage does not vary subsequently (five to six per cent).

At every contact, more of the surgical group are symptom free (six to nine per cent) when compared with the medical group (nought to five per cent). Patients in each treatment group who had recovered from their psychiatric symptoms were compared with the rest, $\chi^2 = 1.656$ (I); $\chi^2 = 5.398$, $p < .05$ (II); $\chi^2 = 9.174$, $p < .01$ (III); $\chi^2 = 2.157$ (IV); $\chi^2 = 0.694$ (V). The suggestion is made that, after surgical treatment, possibly more patients recover from their psychiatric symptoms.

Patients whose psychiatric symptoms improve (group 2) over two and a half years range between twenty per cent and twenty-seven per cent of the group, with no observable difference between medical and surgical patients.

The group of patients whose psychiatric symptoms remain unchanged (group 3) steadily decreases with time; twenty-nine per cent (I); thirteen per cent (V). Apart from contact V, when a sudden drop in the proportion of medical patients who are unchanged occurs, and thus the proportions of both groups are the same, fewer surgical patients stay unchanged (twenty-four per cent (I); thirteen per cent (V) when they are compared with the medical group (thirty-three per cent (I); twenty-six per cent (IV), that is, over the follow-up more surgical than medical patients are experiencing change in their psychiatric symptoms.

Over two and a half years the group of patients whose psychiatric symptoms become worse (group 4) increases; twelve per cent (I); twenty-two per cent (V).

The following percentages in each treatment group were rated as worse on successive contacts:-

Medicals: 14%; 16%; 31%; 18%; 24%.

Surgicals: 9%; 22%; 16%; 19%; 20%.

On the whole fewer surgical than medical patients have become worse, though it can be seen that the number of patients whose psychiatric symptoms are worse after surgery has increased.

During the course of the survey, a number of patients, who had had no psychiatric symptoms at initial interview, developed psychiatric symptoms (Group 5): they were a small, gradually increasing proportion of the group, three per cent (I); ten per cent (V), and the surgical group appeared to make a larger contribution, four per cent (I); eleven per cent (V), than did the medical group, one per cent (I); eight per cent (V).

Rating the Group

The total group was then rated :-

Improved (1 and 2); 29%; 27%; 25%; 32%; 30% - this group showed little change throughout the follow-up.

No change (3) 29%; 21%; 20%; 18%; 13% - a steadily decreasing number of patients.

Worse (4 and 5) 15%; 24%; 28%; 25%; 32%; - an increasing group.

At the end of two and a half years 108 patients, out of a total of 118 who survived, who had been considered to have psychiatric symptoms at initial interview were seen (Table 21). Of these patients forty-three (thirty-nine per cent) had improved, eight (seven per cent) to such an extent that they were considered to have recovered completely, nineteen (eighteen per cent) were unchanged, and forty-six (forty-three per cent) were worse.

When the treatment groups were divided into the three categories, improved, no change, and worse, the following figures were obtained:-

(Table 20)

<u>Medicals:</u>	Improved:	26%;	24%;	15%;	27%;	32%.
	No change:	33%;	28%;	26%;	26%;	14%.
	Worse:	15%;	21%;	37%;	26%;	32%.
<u>Surgicals:</u>	Improved:	32%;	28%;	32%;	36%;	28%.
	No change:	24%;	14%;	14%;	12%;	13%.
	Worse:	13%;	26%;	21%;	25%;	31%.

On all occasions except the last more surgical patients than medicals were considered improved; the medical group showed on the whole much less change in psychiatric symptoms than did the surgical group; medical patients who deteriorated pursued a much more fluctuating course, and did not show the rather steady deterioration that was noticeable in the surgical group.

Summary of Physical and Psychiatric findings in the treatment groups over two and a half years

There was no initial difference in the treatment groups in the numbers of patients with psychiatric symptoms, and the presence or absence of

psychiatric symptoms had played no part in the selection of patients for treatment.

Physical and psychiatric outcomes in the treatment groups have so far been discussed separately. In this section the findings will be summarised and examined together, to see if any relationship between physical and psychiatric outcome can be discerned.

Surgical Patients

Physical results:

- (1) Good physical results of surgery on the whole decrease with time; ninety-one per cent at contact I; seventy-four per cent at contact V.
- (2) Moderate results fluctuate, after an initial low figure of one per cent, between five per cent and fifteen per cent.
- (3) Bad results are increasing (eight per cent increasing to eighteen per cent).
- (4) Men do better than women.
- (5) There is no difference in outcome whether operation is for duodenal ulcer or gastric ulcer.
- (6) Patients who were operated on for pain only appeared to do less well than patients in whom complications of ulcer were present pre-operatively, and it has been suggested that the intractable group contributes to a large extent to the deterioration in good results, with time.

Psychiatric outcome in surgical patients

- (1) Patients without psychiatric symptoms remain at a steady figure; approximately twenty-five per cent.
- (2) Approximately thirty per cent of patients have improved, and this figure also has remained steady throughout two and a half years.

- (3) The number of patients whose psychiatric symptoms remain unchanged decreases steadily.
- (4) There remains a steadily increasing group of patients whose psychiatric state is worse compared with that at initial interview.

Medical Patients

Physical results:

- (1) Patients whose symptoms have improved fluctuated over two and a half years but at the end the group had slightly decreased.
- (2) Patients whose symptoms show no change fluctuate but at the end the group is practically the same proportion (twenty-eight per cent) as at the beginning.
- (3) The group of patients whose symptoms are worse remains almost a constant proportion of the total over two and a half years, but the worst ones will have been converted to the surgical group so the later figures are artificially low.

Psychiatric outcome in the medical patients

- (1) The number of patients who improve is fluctuating, but on the whole a slightly greater number of patients have improved at the end of two and a half years.
- (2) There is a slight downward trend in these patients whose psychiatric symptoms remained unchanged; thirty-three per cent decreasing to twenty-six per cent over two years, and a sudden, sharp drop to fourteen per cent in the next six months.
- (3) The number of patients whose psychiatric symptoms are worse fluctuates over the follow-up but on the whole there is a tendency for this group to increase in number.

The value of assessing peptic ulcer disease at regular intervals over a period of time is demonstrated, and this holds for both physical and

and psychiatric results. Only by so doing can the fluctuations in this disease be appreciated and a possible pattern be mapped out. The results of physical and psychiatric outcome in the treatment groups are depicted graphically in Figures 22 and 23. Perusal of the graph for the surgical patients shows that after operation the position of both psychiatric and physical symptoms is not static in an appreciable proportion of cases. Concurrently with deterioration in physical results, an increasing proportion of patients show deterioration in psychiatric outcome. The number of patients who improved psychiatrically remains a fairly constant proportion of the group, but the number of patients who are rated worse gradually increases over the span of the follow-up.

In the medical patients both psychiatric and physical outcomes have pursued a more fluctuating course but without the more dramatic changes either in the direction of improvement or deterioration that have been noted in those patients who have undergone surgery. The graphs for patients who improved both psychiatrically and physically are very similar in shape, and there is a general tendency for the bad results to increase, but this is much more noticeable in the psychiatric outcome than in the physical outcome. The patients who remain unchanged behave quite differently when psychiatric and physical outcomes are compared.

Thus, psychiatric and physical results have followed a similar pattern when the surgical patients have been observed as a group. Also a different more fluctuating pattern has emerged when the medically treated group has been examined, with some similarities between physical and psychiatric outcome, but not so obviously as obtains in the surgical group. There is a strong suggestion, therefore, that particularly after surgery a relationship exists between psychiatric and physical outcome.

But consideration of treatment groups, however, cannot reveal the

individual's reaction to treatment, whether or not fluctuations can be observed, and whether physical and psychiatric outcome are related in a particular patient. After the above analysis of physical and psychiatric results in the treatment groups, it is logical to analyse physical and psychiatric outcome in the individual patient.

PHYSICAL AND PSYCHIATRIC RESULTS IN THE INDIVIDUAL

Overall Grading of the Patients

Graphs were drawn of each patient on which the physical and the psychiatric symptom rating (1-5) at each contact was depicted. To distinguish the various groups different coloured inks were used. Green ink distinguished those who had no psychiatric symptoms at the initial interview, and red was used to mark the progress of those who, at the beginning, had psychiatric symptoms. Thus, it was possible to distinguish between patients who had recovered (group 1, red) and those who had not, in the span of the survey, had psychiatric symptoms (group 1, green). Yellow ink was used to denote the presence and subsequent progress of patients who developed psychiatric symptoms during the span of the survey. Black ink depicted physical symptoms. In the written exposition of the results these colours will be used to denote patients or groups of patients.

Information was not available at each of the five contacts on every patient so there are a fairly large number of missing observations. However, in the results, 'incomplete' denotes only follow-ups for whom less than three observations were obtained. It does not denote all such follow-ups; if two observations were obtained at a considerable distance in time (> one year) and the patients gave information about the intervening period, the follow-up was not labelled 'incomplete' (I).

The graphs are reproduced in Figure 24. Examination of the graphs revealed that, in many individuals, fluctuations in both physical and psychiatric results occurred. It was necessary, therefore, to seek an overall grading, as distinct from the rating which had been carried out at each six-monthly contact with the patients, whereby these fluctuations could be taken into account and a composite picture of each patient's progress over two and a half years obtained.

The difficulty encountered was, as is common in this type of study, an embarrassing profusion of parameters. Grouping was obviously necessary. To do this the individual graphs were handed to the statistician who, quite independently of the psychiatrist and with no knowledge of the patients, grouped similar graphs together. They fell into six patterns. (This was done separately for physical and psychiatric symptoms for each 'completely' followed up patient who had psychiatric symptoms initially. Patients who had no psychiatric symptoms initially were given a physical grading only).

The six patterns were defined as follows:-

- A: group rated as 1 right through available follow-up results,
- B: group rated as 1 or 2 right through available follow-up results,
- C: initial bad patch (3 or lower) rising to 2 or 1 within two years,
- P: initial good patch (1 or 2) falling to 3 or lower,
- D: zigzags dropping to 3, or consistently down in 3 or 4,
- E: zigzags falling below 3, or consistently down in 4 or 5.

Figure 25 gives an example of a typical graph in each grading; physical and psychiatric gradings are noted on each patient's graph).

Although the original identification of the patterns and the subsequent allotting of grades was done independently of the psychiatrist, there was a considerable element of subjectivity in the identification of the patterns and some subjectivity in allotting grades to the less obvious cases. Also, as will be seen later, an ordering of the patterns was assumed, but this is to some extent artificial as, for example, both C and P are worse than A and B but in different ways. The ordering, as above, was discussed with the psychiatrist, and on clinical grounds an initial bad patch with subsequent improvement has to be judged a better outcome than good results followed by a fall off. Likewise, it is not apparent at first sight that D is worse than E, but grade D is varying between symptoms unchanged/moderate results and symptoms worse, that is, between moderately good and bad results of

treatment, while Grade E is varying between symptoms worse and symptoms unimproved (that is, admission to hospital, and possibly a second operation) and these are both definitely bad results of treatment.

With these reservations on the extent of subjectivity the ordering, clinically, appeared to be reasonable and an "overall" picture of each individual's progress over two and a half years was achieved. This was valuable, since in very few cases was the same position maintained for the duration of the follow-up period. Table 26 depicts the number of surgical patients in each psychiatric category, that is, green, green and yellow, red, who remained in the same physical group throughout two and a half years (constant follow-up), and those who changed their physical group during the follow-up (non-constant follow-up). It appears that the red surgical patients were contributing to a greater extent to the non-constant physical follow-ups than patients in the other two categories.

Similar findings obtained in the medical patients. This emphasizes the need to look at results of gastric surgery or medical treatment for peptic ulcer over a period of time and not at some arbitrarily selected single time point.

A consistency check was carried out to see that gradings were "reasonable". It might be expected that the final follow-up rating at two and a half years should bear quite a close relation to the overall grade, and the initial follow-up rating a less close relation, but still not very different. The number of really erratic cases is quite small. Table 27 shows the results of this for surgical and medical patients, which compare well with expectations under an assumption of reasonableness for the grading. (Good = 1,2, or A.B.C.: Bad = 3,4,5, or P.D.E.).

Psychiatric Symptoms and Physical Outcome

The physical grading was used first and then the rating on the two and

a half year physical follow-up, to assess success of treatment (Good = 1,2, or A.B.C., Bad = 3,4,5, or P.D.E.). Surgical and medical groups were considered separately. In order to compare the proportions of patients with psychiatric symptoms and those without psychiatric symptoms who had good and bad results of surgery, a two by two table was constructed comparing good and bad surgical outcome in these two patient groups (Table 28A). A significantly higher proportion of patients without psychiatric symptoms had a good surgical outcome ($\chi^2 = 5.316$, $0.02 < pr < 0.05$).

Patients who subsequently developed psychiatric symptoms were then discarded (Table 28B). Good and bad results of surgery were then compared in those patients who never developed psychiatric symptoms and those with psychiatric symptoms at initial interview, $\chi^2 = 6.210$ $p < .02$.

It is very clear, therefore, that the best results of surgery are obtained in patients who show no psychiatric symptoms before operation, and better still in those who show no psychiatric symptoms at any time.

A similar tendency was present in the medical group but it did not show so clearly as in the surgical group (Tables 28C and 28D). When patients without psychiatric symptoms were compared with those who had psychiatric symptoms at initial interview for good and bad medical outcomes the difference did not attain significance ($\chi^2 = 3.456$, $0.05 < pr < .10$), but did so when, as in the surgical group, these patients who subsequently developed psychiatric symptoms were discarded ($\chi^2 = 4.803$, $0.02 < pr < .05$).

When the assessment on rating at two and a half years was considered (instead of the overall grade) in exactly the same way, (Tables 29A and 29B) similar results were obtained for the surgical patients, that is, a significantly higher proportion of patients without psychiatric symptoms had good results. The medical patients did not, on this assessment, show this (Tables 29C and 29D), and no significant difference could be demonstrated.

In an attempt to explain the discrepancy between results on 'grade' and on rating at two and a half years for the medical patients, the individual graphs were re-examined. Seven individuals in grade D have a final physical follow-up rating 1 or 2. One died (116) so possibly should not have been classified as 'good'. This, however, we did regard as justified as he died of carcinoma of the colon with liver metastases and his ulcer symptoms remained in abeyance during his terminal illness. Two patients got off to a very slow start and should probably really be graded C (156, 44). One had a bad patch near the end and should possibly be B (178). Three were erratic (2, 125, 157) and happened to be on the top of a zigzag when interviewed. Therefore, of the seven individuals who gave the discrepant results, six illustrate the difficulty of judging a relapsing disease such as chronic peptic ulcer on one follow-up at any arbitrarily chosen point in time.

Having now shown that patients with psychiatric symptoms do less well than patients without psychiatric symptoms, a further study of the graphs poses the following question - among the 'greens' one patient had a final physical rating of 3, but had kept well till then (rated as 1 and 2). Will he develop psychiatric symptoms?

Among the 'green and yellow' one patient with a bad physical outcome (3 and 4) developed psychiatric symptoms and was diagnosed "anxiety in an immature personality" towards the end of the survey. This suggested that he was wrongly labelled at the beginning because when he did develop psychiatric symptoms the interviewer considered that these occurred on the basis of a personality problem.

Identification of particular psychiatric diagnostic group with poor outcome.

An attempt was then made to see if it were possible to identify which

patients of the psychiatric group would be more likely to do badly.

From inspection of the graphs it can be seen that the majority of patients show physical and psychiatric symptoms following the same or comparable rises and falls. In ten cases, however, physical and psychiatric symptoms change in opposite directions, that is, a good physical result in that patient coincides with a bad psychiatric result. These cases were examined to discover any reason why they should differ from the others. However, no single psychiatric diagnosis was found in this particular group, but on the other hand the majority of psychiatric diagnoses made at initial interview occurred. Nothing, therefore, points out these cases as being obviously different from the rest.

The 'reds' whose progress was generally bad for the duration of follow-up were then looked at as a whole. There seemed to be a slight tendency for the 'immature' to be over-represented among them (Table 30). As the numbers were small it was necessary to apply Yates correction to the χ^2 test when patients diagnosed as immature were compared with the rest. The difference was not significant, $\chi^2 = 2.83$. It therefore remains only at 'suggestion' level that the immature personalities do less well.

In summary It is suggested that patients without psychiatric symptoms do significantly better whether treated medically or surgically. No single psychiatric diagnosis has been associated with unfavourable outcome, though it is tentatively suggested that future investigation into the problem of immaturity might be fruitful.

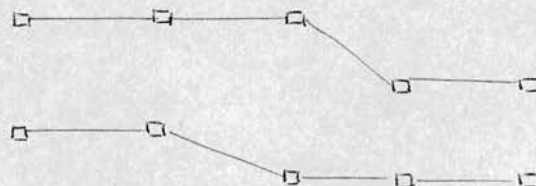
Relationship between Physical and Psychiatric Outcome

It was then logical to see if physical and psychiatric outcome were related in any way. The grades described above were used, and all patients who showed psychiatric symptoms initially, and whose follow-ups were 'complete' were considered. There were fifty-one patients who fulfilled these criteria who had been treated surgically and fifty-seven who had been treated medically. Calculations for the Spearman Rank Correlations for these two treatment groups are given in Tables 31 and 32.

There is a significant rank correlation for physical and psychiatric grading for both groups (surgical group - significant at one per cent, medical group significant at five per cent). If the assumptions about the ordering of the grades are not too unreasonable, the inference is that those whose psychiatric outcome is best get the best physical results also. Thus a relationship between physical and psychiatric results has been established but not a dependence of one on the other. Both may depend on some other factor.

This relationship was then investigated, to see whether changes in physical outcome were regularly followed, or preceded, by changes in psychiatric outcome.

The graphs were examined again. Sometimes a follow-up graph appeared as shown underneath,



where there was a close correspondence which was just a little out of step. There were ten of these 'lag' curves. In only one did the symptoms move in

opposite directions after the lag. In a further three instances the psychiatric symptoms changed but the physical symptoms did not or vice versa. These were picked out of a number of possible contenders as being ones in which a lag could have taken place, for example, the symptoms were not already rated 1 so they could move up. In six cases the physical symptoms changed first, followed by the psychiatric symptoms. In three cases the psychiatric symptoms changed first. In the single case where they moved in opposite directions the psychiatric ones moved first. The numbers are unfortunately much too small to make any definite deductions. It can only be suggested that this might be a possible method of investigation of the problem with more extensive data.

Another approach to the problem of relationship between psychological symptoms and physical outcome was to look at the rises and falls on the graphs and to try to calculate the expected number of 'concordant' intervals on the assumption of independence of psychiatric and physical results. This then can be compared with observation.

The simplest approach would be to assume that whether there is an improvement, no change, or a relapse in a particular six-month period, depends only on the six months in question. If this is done 180 intervals are obtained from the fifty-one complete surgical follow-ups (Table 33). The results suggest a very strong tendency to change in the same direction, both for better or worse. However, the assumption of independence on which this is based is not even approximately true. The probabilities of improvement, conditional on no change in the previous six months, conditional on improvement in the previous six months, and conditional on relapse in the previous six months, are not the same. An assumption was then made which it was hoped would be more realistic. It was assumed that the change in a particular

interval was dependent only on that interval and the one immediately preceding it. Even this assumption is a rather crude approximation (as can be seen from the conditional probabilities in Table 34) but it represents a considerable improvement on the assumption of complete independence. The surgical patients were considered first (Table 35), and then the medical patients (Table 36). The calculations show that when there is a change in both sets of symptoms in a six month period, there is an excess of intervals in which the changes take place in the same direction. If the directions of change in both physical and psychiatric symptoms were independent, values as extreme as these would be obtained in about seven per cent of investigations. This holds for both surgically and medically treated patients. Although five per cent significance is not attained, the evidence is certainly very suggestive. (It could be argued that one-tailed tests are appropriate here in which case the probabilities of observing values as high as these are halved.)

Thus using clinical assessments only, it seems that psychiatric and physical outcomes are related, good results in one appearing with good results in the other.

Goers and non-goers

After the initial interview each patient with one exception (No.41), which was due to an omission on the part of the interviewer, completed a questionnaire. The format of this has been discussed fully, but to summarise, it consisted of three sections :-

- a) Anxiety scale - 20 questions.
- b) Psychasthenic Scale - 20 questions.
- c) 4 questions on each of six topics, n. Aggression, n. Endurance, n. Counteraction, n. Succourance, n. Exhibitionism, n. Autonomy, - as defined by Murray in "Explorations in Personality".

As discussed previously, Goers would be expected to have a high score in n. Endurance and n. Counteraction and Non-goers in n. Aggression, n. Succourance, n. Exhibitionism and n. Autonomy. Also, from examination of the letters, where the clinicians at outset had been asked to define their respective concepts of the goer and non-goer, it was noted that the overtly anxious patient was mentioned as having a high probability of a poor surgical outcome. The work record of the patient also featured in the assessment for operation, a consistently poor record over the years being considered indicative of a poor outcome. It seemed reasonable, therefore, in addition to the six attributes in (c), to take cognizance of anxiety and work record in the calculation of a "Goer" and a "Non-goer" score for each patient (Table 37).

With the exception of work record and anxiety, these had been scored as 0,1,2,3 or 4. Work record scores were assessed 1 to 5, each patient where applicable having two assessments, (a) before peptic ulcer was diagnosed and (b) after peptic ulcer was diagnosed. The following calculation was undertaken in order to transform these ratings to the same scale; 0 = drop of 3 points, 1 = drop of 2 points, 2 = no drop or a rise, and the resulting score was multiplied by $\frac{4}{3}$. The anxiety scale (0-20) was divided by 5 to achieve a range 0-4. A total 'goer' score and 'non-goer' score was thus calculated for each patient by simple addition. This system allotted equal weight to all the attributes considered. It was realised that deductions from these scores were dependent on the clinicians having articulated their clinical hunches correctly, on the interviewers having interpreted them correctly, and on the assumption that it was correct to allow equal weights to the eight attributes.

The hypotheses were -

- a) a negative correlation should be present between 'goer' and 'non-goer' scores,

- b) 'goers' do well in physical follow-up assessments,
- c) 'non-goers' do badly in physical follow-up assessments.

These hypotheses were then examined in turn, and the following results obtained :-

(a) The total 'goer' scores and the total 'non-goer' scores as calculated above for each patient were then divided into high (> 6 for 'goer' and > 10 for 'non-goer') and low scores. In this way a two-way table of observed pairs of values can be obtained. The table was as follows :-

Goer \ Non-goer			
	High	Low	
High	46	58	104
Low	10	27	37
	56	85	141

$$\chi^2 = 3.37, p > 5\%$$

If there were negative correlations between 'goer' and 'non-goer' scores, there should be big contributions from the top right and the bottom left cells. In fact, it can be observed from the table that it is the diagonal cells which exceed expectation and not the off-diagonal cells. This suggests that the two scores are not measuring opposing attributes as had been hoped.

(b) and (c) The average 'goer' and 'non-goer' scores attained by patients in the grades A-E which had been previously allotted on physical follow-up were calculated (Table 38).

When regression lines $A = 0 \dots\dots\dots E = 5$, omitting the incomplete follow-ups (I), were fitted, the following figures were obtained : -

Non-goers $\hat{\beta} = 1.81 \pm 2.01$ (95% confidence interval)

Goers $\hat{\beta} = -1.153 \pm 2.179$ (95% confidence interval)

There was, therefore, no significant dependence of physical follow-up grade on either 'goer' or 'non-goer' score.

It is realised that this can be a rough assessment only, depending on the essential rawness of the data, and the possible inaccuracies of initial interpretation. This essentially negative result is probably easier to assess than a positive result would have been. It appears that the concept of 'goer' and 'non-goer' is not helpful in predicting surgical and medical outcomes of treatment.

Anxiety Score and Outcome of Treatment

In this section the raw anxiety score (0-20) was used, and the physical grading A to E, with the ordering that Grade A represents the best result at surgery and E the worst result.

The Spearman Rank Correlation between the overall physical grading and anxiety score was calculated for DU's and GU's separately. For DU's the S.R.C. is 0.312 - significant at 1%. For GU's the SRC is 0.215 - not significant at 5%.

As was done with 'goer' and 'non-goer' scores, the average anxiety score within the physical grades, A to E, was considered and regression lines fitted (Table 39) DU's being considered separately from GU's, and the incomplete follow-ups (I) being at first excluded from the considerations.

DU's $\hat{\beta} = 0.960 \pm 0.520$ (95%) or ± 0.860 (99%).

When the incomplete follow-ups (I) were included, the following figures were obtained :-

DU's $\hat{\beta} = 1.104 \pm 0.664$ (95%) or ± 1.100 (99%)

This indicates a dependence of the overall physical grading on anxiety score which is significant at 1%.

GU's 15 patients with a good physical outcome (i.e. overall physical grading A,B,C) had an average anxiety score of 5.73.

12 patients with a bad physical outcome (i.e. overall physical grading P,D,E) had an average anxiety score of 7.58.

One patient had an 'incomplete' follow-up (I) and the anxiety score in this case was 6.00.

This finding suggests a similar dependency of the overall physical grading on the anxiety score in gastric ulcer patients.

Also, DU's with psychiatric symptoms score significantly higher on anxiety than do DU's without psychiatric symptoms (Table 63, Appendix IV).

GU's with psychiatric symptoms also score higher than do GU's without psychiatric symptoms but the difference does not reach significance. Hence in considering patients with high anxiety we are considering the psychiatric patients from a different point of view. The above results are consistent with the previous finding that patients without psychiatric symptoms before treatment do significantly better than patients with psychiatric symptoms. They therefore afford an objective "check" on the initial clinical psychiatric assessment. Both psychiatric assessment and anxiety score have thus proved to be predictive of outcome of treatment.

It was observed in the above calculations that the patients who were graded B had a bimodal distribution of anxiety scores. Those scoring 9+ on anxiety, who had thus done better than expected, were extracted. They were found to contain a large proportion of those individuals who in the course of follow-up had been formally referred by the Gastro-Intestinal Clinicians to the psychiatrist for assessment and treatment. In view of this, it seemed worthwhile considering all patients who did very well (A and B) and yet had high (9+) anxiety scores. There were fourteen of these, of whom seven had had psychiatric treatment. Of the other patients thirteen out of 163 had had psychiatric treatment. This difference is significant at least at 5%.

Pr (having had psychiatric treatment in Grade A or B and anxiety 9+) has 95% confidence interval, $0.238 < p < 0.762$.

Pr (having had psychiatric treatment otherwise) has 95% confidence interval, $0.038 < p < 0.121$.

These intervals were calculated using $\chi^2 = \sum \frac{(O_i - E_i)^2}{O_i}$

This suggests that patients with high anxiety scores who would be expected to do badly, in fact have their outlook improved by psychiatric treatment.

To investigate this further, all patients with anxiety scores of 9+ were considered. Of these treated psychiatrically ten had grade A,B, or C, and nine had grade P,D,E or I. Of these not treated psychiatrically eleven had grade A,B or C, thirty had grade P,D,E or I (Table 40). When the proportions of patients with good or bad results were compared in these who had or had not received psychiatric treatment, the difference failed to reach the level of significance at 5% ($\chi^2 = 3.799$, $0.05 < p < 0.06$).

The DU's were then considered separately and an essentially similar table was obtained but here significance was attained at 5% ($\chi^2 = 5.334$).

This finding bears out what has been suggested before. It throws out a suggestion for treatment. Having isolated both by clinical assessment and on testing, a group which would be expected to do badly, it appears that a possible way of improving physical outcome of treatment be concurrent psychiatric treatment of that group.

Dependency Score and Physical Outcome

A 'dependency' score was calculated for each patient by summing n. Succourance and n. Counteraction (0-8).

The average score for each patient was calculated, DU's being treated separately from GU's (Table 41).

No trend was apparent here. If a regression line is plotted for the DU values, omitting the I's, the following is obtained :-

$$\hat{\beta} = 1.725 + 6.838 \text{ (95\%)}$$

There is thus no dependency of physical grade on dependency score. Table 63, Appendix IV shows that there is no difference in either DU's or GU's between patients with psychiatric symptoms and those without psychiatric symptoms with respect to Counteraction. DU's with psychiatric symptoms scored significantly lower on succourance.

Hostility Score and Physical Outcome

Each patient was given a Hostility score rated 0-4 (n. Aggression).

As before the average scores within grades were calculated (Table 42).

If a regression line is plotted for DU values omitting the I's,

$$\hat{\beta} = -3.233 \pm 2.792 \text{ (95\%)} \text{ or } \pm 4.918 \text{ (99\%)}.$$

This is just significant at 5% and suggests that high hostility and good physical outcome are related.

However, neither DU's nor GU's showed any significant difference in hostility score between those with and those without psychiatric symptoms (Table 63, Appendix IV). This makes it difficult to reconcile the finding that high hostility and good physical outcome are related, when it has already been shown that absence of psychiatric symptoms is predictive of good outcome. But the measurement used here for hostility is a very rough one indeed, and based on the answers to four questions, with the result that findings must be very tentative. They are included here with the suggestion that this might be a fruitful approach for further research.

Indications for operation and Physical and Psychiatric Outcome

The suggestion has been made, from consideration of the group of surgical patients, that the fall-off with time in good physical results was mainly attributable to those patients who were operated on for intractability rather than for complications, though no definite claim for significance could be made.

The indications for surgery - complications (C) intractability (I) were considered along with the physical and psychiatric follow-up grades. In this section all patients who showed no psychiatric symptoms initially, i.e. the greens, and the green and yellows, were classified as good on psychiatric follow-up, along with grades A,B and C of the reds. The incomplete follow-ups (I) were omitted from the considerations.

(a) The psychiatric follow-up grade was considered with the indications for operation (Table 43A).

There is a slight suggestion that the patients whose indication for operation was pain are the poor psychiatric cases, and the patients in whom complications necessitated operation are the good psychiatric cases.

(b) The physical follow-up grade was considered with the indications for operation (Table 43B).

A significantly higher percentage of patients who had been operated on for complications had a good physical result compared with patients who had been operated for pain only.

(c) The psychiatric follow-up grade was considered with the physical follow-up grade.

(Table 43C)

This table shows that the psychiatric follow-up grade is very definitely associated with the physical follow-up grade.

In summary, patients operated on for complications and who are also free

of psychiatric symptoms give a high probability of good outcome.

The presence of psychiatric symptoms at initial interview gives a higher probability of poor outcome than does intractability.

Summary of the findings after the examination of the individual patients

1. Patients who have been assessed as having no psychiatric symptoms at initial interview do better than patients with initial psychiatric symptoms. This is more marked in surgically treated than medically treated patients.
2. There is a definite relationship between physical and psychiatric symptoms. Good physical and psychiatric outcome of treatment is found together as is bad physical and psychiatric outcome.
3. Attempts to isolate a particular psychiatric group in whom a poor result of treatment is more likely have failed, though it has been suggested that the immature patient is more likely to have a poor outcome.
4. There is an association between high anxiety scores and the presence initially of psychiatric symptoms.
5. Patients with high anxiety scores do less well than patients with low anxiety scores.
6. An attempt to systematise and quantify the classifications of patients as Goers and Non-goers has not proved successful in the prediction of outcome of treatment.
7. Dependency ratings have not proved helpful in the prediction of outcome of treatment.
8. A tentative suggestion has been made that high hostility is related to good physical outcome.
9. Indications for surgery are associated with outcome. Patients undergoing operation for the relief of complications do better than patients coming to operation because their symptoms have failed to respond to medical treatment.

10. The suggestion has been made that a higher proportion of patients with poor psychiatric outcome are found in the group whose indication for operation is intractability.

11. Psychiatric assessment of the patient before surgery is more closely associated with outcome than is the indication for operation.

12. Patients with high anxiety scores who do better than expected are those who have had psychiatric, in addition to physical, treatment.

WORK RECORD OF THE PATIENTS OVER TWO AND A HALF YEARS

Working patients were defined as those patients who were in employment at the time of entering the survey. Married women were included if they had been in part-time or whole time employment for one year prior to entering the survey.

Retired patients and housewives were thus graded as not applicable in this section.

Return to work after operation (Table 44)

According to this definition, eighty patients of the surgically treated group were workers. On these eighty patients a cumulative frequency curve was drawn against time (Diagram 45).

Half the patients returned to work within two months of operation and three quarters were back at work within three months. Ninety per cent of the group were back within six months of operation, but it was more than two years before the remaining ten per cent were back at work.

Work record in surgical and medical patients

The surgical group was then compared with the medical group from the point of view of the work record of the two groups. This it was hoped would afford an assessment of how surgery was dealing with the large problem of peptic ulcer morbidity in the general population.

Change or otherwise was recorded at each contact with reference to the previous contact, so that some idea of the shift of the working ulcer population over two and a half years might be obtained (Table 46).

At each contact about fifty per cent of the patients had not changed jobs, between three per cent and seven per cent were not working, and nine per cent to fifteen per cent had changed jobs. There was no difference between the groups for those patients who did not change. There was a

tendency for more of the surgical group to record a change of job especially in the first two contacts, and a suggestion that more of the medical group, especially on the third and fourth contact, were unemployed.

Patients who changed their jobs (shifting working population), numbering 21,25,19,14,19, at contacts 1 to V respectively, were regarded in more detail (Table 4.7). Between sixty and one hundred per cent of this group, depending on the contact, had changed to a better job.

In the surgical patients, initially only one half of those who changed jobs changed for the better, although with length of time from the initial contact the position improved. At contact IV all those surgicals who changed jobs did for the better, but in the final contact only seven out of twelve had done so.

Medically treated patients, apart from contact III when the positions were reversed, had a greater proportion of patients changing for the better compared with the surgical group.

Two by two tables were constructed comparing patients in the two groups who had changed for a better job with the others,

Contact 1 $\chi^2 = 4.325, p < .05.$

Contact II $\chi^2 = 3.513, p < .10.$

Contact III $\chi^2 = .396$ (NS).

Contact IV $\chi^2 = 6.398, p < .02.$

The figures are very small so it is dangerous to draw firm conclusions from them but they do suggest that the medical group, when they change jobs, do better than the surgical group.

Activity rating in the non-working population

In this section all the women were included together with a very few men, retired, living on their own, and doing their own housework. They

were given an 'activity' rating (Table 48).

Contrary to the working population, at all contacts more of the surgically treated group said they were working as before (between eighty-three to one hundred per cent). The medical group fluctuated more, decreasing from eighty-three per cent at contact I, to just over half the group at contact III, and then rising to three quarters of the group at contact V.

Two by two tables were constructed comparing the patients at each contact in both groups who were working in the house as before, with the others ($\chi^2 = 0$; $\chi^2 = 3.001$, $p < .10$; $\chi^2 = 2.908$, $p < .10$; $\chi^2 = 1.743$; $\chi^2 = .686$.) The differences between the groups do not reach significance level, though the suggestion remains that the operation group unlike the similar group in the working population are doing better.

Apart from contact I, where six per cent of the surgical group compared with three per cent of the medical group considered that their activities had decreased, more of the medically treated patients thought they were doing less.

A small proportion of the group (two per cent to nine per cent) were not doing their own housework and again this seemed to be concentrated mainly in the medical group. The numbers are, however, so small in these last two categories that a suggestion that this might be so, is all that can be recorded.

DRINKING HABITS

The patients were rated on change in drinking habits compared with that obtaining at the initial interview. They were then asked to specify the amount in spirits and beer as accurately as possible (Tables 49 and 50).

Drinking habits in the females

The drinking habits of the females were remarkably constant over two and a half years in both groups. In two isolated instances women in the surgical group reported that they were drinking more. In neither of these cases was drinking a problem as their consumption had increased from a glass of sherry, on social occasions, to a few glasses of wine and an occasional brandy after a meal in a restaurant. Two women who had been surgically treated considered they were drinking less, and two women in the medically treated group at contact 1 also thought so. In the women, therefore, there was no drinking problem in either group and in particular the habits of the surgical group did not change after operation.

Drinking habits of the males

It seemed from the tables that the males were changing their drinking habits more than the females. They were therefore considered separately (Table 51). Hospital policy is to warn all peptic ulcer patients after operation about the hazards of drinking until they have learned to adjust to a possibly changed capacity for alcohol. Medical patients are advised that alcohol may aggravate ulcer symptoms and are advised to curtail spirit drinking. At contact 1 fifty-six per cent and sixty-one per cent of surgical and medical groups, respectively, have recorded no change. Of those who recorded a change three quarters did drink less, but this number decreased very sharply, till by contact V ninety per cent and ninety-four per cent of the groups were drinking as before. Of the patients who drank more, there was no difference between the treatment groups, but the figures fell from

twelve per cent and ten per cent at contact 1 to five per cent and four per cent by the end of the follow-up. There was no real difference between the treatment groups when those who drank less were considered. Thus in terms of quantity of alcohol drunk, comparing amounts pre-operatively and after, and in the medical group at initial interview and after, there was no difference between the two treatment groups.

Effect of alcohol (Tables 52 and 53)

When the question of the effect of alcohol on the individual patient was considered, differences appeared. No women had noted any change, possibly because in this sample the women drank comparatively little compared with the men. The men were recording change so they were treated separately (Table 54).

The great majority of the male medical patients (ninety-four to one hundred per cent) noted no change in the effect of alcohol, none thought that alcohol had less effect on them, and the remaining three per cent to six per cent thought that alcohol had more effect. In the surgical group, initially over a quarter of the men (twenty-six per cent) noted the effect of alcohol was increased, but this diminished till at contact V only fifteen per cent thought this effect of operation still persisted. A small proportion considered that they could drink more before noticing the effect of alcohol intoxication.

In order to compare the proportions of male patients in the two treatment groups who considered that alcohol had more effect, two by two tables were constructed comparing those patients after medical treatment and those patients after surgical treatment who had noted an increased effect with the rest.

$$\begin{aligned} \chi^2_1 &= 6.370, p < .02 \text{ (I)}; \chi^2_1 = 7.401, p < .01 \text{ (II)}; \chi^2_1 = 7.993, p < .01 \text{ (III)} \\ \chi^2_1 &= 5.337, p < .05, \text{ (IV)}; \chi^2_1 = 5.910, p < .02 \text{ (V)}. \end{aligned}$$

Between the two treatment groups, therefore, there was a significant difference in that more surgical than medical patients considered that alcohol had an increased effect.

One would expect, therefore, that the surgical group with this significantly decreased tolerance to alcohol might have problems related to alcohol, though for the group as a whole, over the limited time span of two and a half years, there has not been demonstrated any increase in the quantity drunk.

The patients' records were scrutinised for problems related to alcohol consumption, either at work or at home or involvement with the police. Only three people were involved.

(1) Male duodenal ulcer patient with a partial gastrectomy

Psychiatric pre-operative assessment - character disorder only - manic depressive personality. His pre-operative drinking habits were an occasional whisky with two to three pints of beer every evening. He was a very successful sales representative for an ice cream firm. On the 31st September 1963 he was charged with being drunk in charge of his car, and subsequently lost his driving licence for eighteen months, and was fined twenty-five pounds. After operation, he was definitely drinking less, an average of six pints of beer per week and he had stopped drinking spirits. He noted that alcohol had a greatly increased effect on him but "was not prepared to modify his consumption any more". He was sacked from his job after his conviction and remained unemployed for six months before obtaining a much inferior job as a salesman with another firm. At this time he developed total alopecia areata. At the end of eighteen months he was reinstated with his old firm. Regrowth of hair commenced just prior to this and was complete in a month. In the last year of the follow-up he was

drinking exactly the same quantity as pre-operatively and found that his tolerance had also returned to pre-operative level.

(2) Male duodenal ulcer patient with a partial gastrectomy

Psychiatric pre-operative assessment - no psychiatric symptoms. His pre-operative drinking habits were an occasional whisky with two pints of heavy beer every evening, and eight to ten pints of heavy beer on Friday and Saturday nights. About twenty years previously, for five years, during which he worked in a whisky bond, he drank two bottles of spirits per day during working hours. At the time of entering the survey he was employed as a general labourer, and admitted to frequent quarrels with his wife on account of his drinking habits. Six months after operation, because he had noted decreased tolerance to alcohol he was drinking one pint of light beer every evening and six pints at weekends. About this time also he developed depressive symptoms, following the death of his son. One year after operation he was drinking twice as much as pre-operatively; he had started drinking two pints of beer in the mornings before going to work, and his depressive symptoms had gone. Just over two years post-operatively he lost his job on account of his drinking habits as he had begun to miss days at work and to arrive late in the mornings. After three weeks unemployment he obtained another labouring job which was rated as "worse". At contact V he still noted decreased tolerance to alcohol.

(3) Male duodenal ulcer patient with a partial gastrectomy

At initial interview (April, 1963) he was noted to be a very heavy drinker, consuming half a bottle of spirits and eight to ten pints of beer in the course of a day. Socially, he was completely isolated. He had a history of losing jobs on account of his drinking habits but for the previous ten years had been in steady employment selling newspapers.

Psychiatric assessment - inadequate psychopath, below average mentally, alcoholic. There was no change in his pattern of living over the next fifteen months. A Polya Partial Gastrectomy was carried out in July, 1964. Post-operatively his drinking increased to half bottle of spirits and twenty-five pints of beer daily. He noted no change in his tolerance to alcohol. Four months after operation he was sacked from his job on account of his drinking habits and he has not worked subsequently. Over the next fifteen months of observation he has had numerous admissions to the Royal Infirmary, Edinburgh, for attempted suicide, three prolonged admissions to mental hospital for alcoholism, and numerous attendances at other casualty out-patient departments threatening to commit suicide, or complaining of intolerable headaches, backache and depressive symptoms. When last assessed in October, 1965 he claimed he was drinking thirty pints of beer per day and more than half a bottle of spirits. He has deteriorated markedly in personal habits and appearance.

Over the span of two and a half years only three patients of the group, therefore, had trouble with alcohol. The numbers are very small, possibly because the survey was not continued for a sufficient length of time. All three patients had had surgical treatment of their ulcers, and gave a pre-operative history of regular daily drinking, though in (2) and (3) only, were there previous episodes of 'trouble'. Patients (1) and (2) found that their capacity for alcohol decreased following operation and in (1) this led directly to his conviction. He did not increase his drinking following surgery. Patients (2) and (3) did definitely increase the quantity of alcohol consumed. Only in patient (3) has alcoholism been a real problem. When his condition over eighteen months before operation was

compared with that over the same period of time post-operatively,
it could be observed that he had definitely deteriorated following
operation.

SMOKING HABITS

The policy of the Gastro-Intestinal Unit is to advise all patients with peptic ulcers, if not to stop smoking, to cut their tobacco consumption as much as possible. This is much more easily enforced in the in-patients. In particular, in patients awaiting surgery this is the rule for twenty-four hours prior to operation. It was considered, that in this essentially middle-aged population who had started smoking at an early age, it would be interesting to see how much modification in smoking habits had actually taken place over two and a half years.

Initially the group was rated on change in smoking habits with reference to the previous contact (Table 55). The figures for medical and surgical patients are close. Forty per cent of the surgical group recorded a change at contact I but this decreased to less than half that figure at contact V. Twenty-nine per cent of the medical group initially recorded a change but this decreased to eleven per cent at contact V. In the majority of contacts a higher percentage of women did not change their smoking habits compared with the men, and this held for both surgical and medical patients. At each contact a higher percentage of the men were unknown. Discounting these, therefore, (Table 56) the tendency for reversion to pre-treatment smoking habits seems to occur more in men than in women. In order to compare men and women for recorded change in smoking habits, two by two tables were constructed comparing the men and the women in the two treatment groups who recorded a change in smoking with the rest.

Surgical patients $\chi^2 = 6.328, p < .02$ (I); $\chi^2 = .307$ (II); $\chi^2 = .098$ (III); $\chi^2 = 1.535$ (IV); $\chi^2 = .511$ (V). Only at contact I, therefore, did a significantly higher number of men record a change compared

with the women.

Medical patients $\chi^2 = .969$ (I); $\chi^2 = 1.582$ (II); $\chi^2 = .033$ (III); $\chi^2 = 1.947$ (IV); $\chi^2 = 3.303$, $p < .10$ (V). The differences did not reach significance.

All in all, therefore, there appeared to be no sex differences in the change in smoking habits in either treatment group, except possibly immediately after operation.

The surgical and medical groups were then compared, keeping the sexes apart at contact 1, and at all other contacts considering the total group.

Fifty-one per cent of the males in the surgical group recorded a change at contact 1, while only thirty-five per cent of the medical males did so ($\chi^2 = 3.232$, $p < .10$). This suggested that more of the former group had changed their smoking habits than the latter. There was no significant difference between the women of each treatment group at contact 1 ($\chi^2 = .014$).

At other contacts the differences between the treatment groups were not significant. ($\chi^2 = 1.082$ (II); $\chi^2 = .706$ (III); $\chi^2 = 2.447$ (IV); $\chi^2 = 1.295$ (V).

The patients who recorded a change in smoking habits were rated as stopped smoking, smoking less and smoking more (Table 57).

At contact 1, eight men (twenty-seven per cent of those who changed) in the surgical group, and six men (twenty-nine per cent of those who changed) in the medical group had stopped smoking. It is noticeable from the table that in the surgical group the number of patients who stopped or cut their smoking consumption decreased with length of time from the operation. Only two men, who stopped prior to operation, did not smoke again throughout the length of the follow-up. The tendency is for the surgical group, if they change their smoking habits, to increase their smoking consumption.

In the medical group this distinction is not nearly so marked and the patients who recorded change are more evenly distributed between the categories. These patients also tend to vary more from contact to contact. This is most likely to be a reflection of the ups and downs of chronic ulcer disease. Many patients volunteered the information that in a bout of ulcer dyspepsia they cut their smoking as this tended to aggravate the pain, and then returned to their previous level once the ulcer symptoms had subsided.

Table 58 shows that there is no difference between DU's and GU's when the change in smoking habits is analysed against site of ulcer.

The smoking habits of both groups have tended, therefore, not to alter over the span of the survey.

RESULTS OF THE FOLLOW-UP AT THREE YEARS

Contact with the patients (Table 59)

One hundred and sixty (ninety per cent) patients were contacted at this follow-up.

Sex of patients and contact

On this occasion seventy per cent of the men came to the clinic while only sixty-two per cent of the women did so. Other methods of obtaining information gave similar percentages for both sexes (twenty-one per cent of the men; twenty-two per cent of the women). Thus, on this occasion information was available on more of the men (ninety-one per cent) than the women (eighty-six per cent) which was a reversal of the situation found previously. The difference between the sexes, however, was not significant ($\chi^2 = 0.295$).

It seems that the extra effort entailed in this follow-up had resulted in eight per cent more patients being found, and this group included more men than women, but the difference of contact between the sexes was not significant.

Site of ulcer and contact

When the group was divided according to site of ulcer, contact had been made with 137 patients with duodenal ulcer (ninety-one per cent) and twenty-three patients with gastric ulcer (eighty-five per cent), which again was a reversal of the position found previously, but the difference between these groups did not attain significance ($\chi^2 = 1.298$).

Treatment and contact

Ninety-one per cent of the operated group were contacted as compared with eighty-seven per cent of the medically treated group. Deaths which had occurred during the three years of the follow-up had all occurred in the latter group (five per cent) so that in fact the same percentage of the medical group which survived was seen. Mode of treatment had made no

difference to the follow-up of the patients.

The characteristics of this contact group at three years, broken down by sex, site of ulcer and treatment, have thus not been altered by the slightly different method of contacting the patients on this occasion. They can, therefore, be regarded as a fair sample of the original group of 178 patients with peptic ulcer and consequently it is valid to compare findings at all stages of contact.

PHYSICAL AND PSYCHIATRIC OUTCOME IN THE TREATMENT GROUPS

No further operations have been carried out in the last six months on the medically treated group. The final figure for the operated group thus remains the same; ninety-eight patients (fifty-five per cent). One more patient had had a second operation; he had previously had a gastro-enterostomy but had required the more radical operation of gastrectomy following perforation of an active duodenal ulcer. This brings the total of second operations in the surgical group over three years to five, that is, a second definitive attempt was required in these patients to effect surgical cure of their ulcer symptoms.

Since no additional medical patient had undergone surgery in the last six months of the follow-up, the indications for operation as described at the end of two and a half years are unchanged.

Physical results of surgery (Table 60)

In the consideration of the results the patients were rated (1-5) for physical outcome of medical or surgical treatment, and for psychiatric outcome, in exactly the same way as they had been rated at each six-monthly interval throughout the period of the follow-up.

The final rating at three years for physical outcome of surgery in the patient group was as follows :-

1. No symptoms; 33; 38%.
2. Mild symptoms easily controlled; 35; 40%.
3. Mild symptoms not controlled - satisfactory; 7; 8%.
4. Mild symptoms not controlled - unsatisfactory; 13; 15%.
5. Unimproved; 0.

As before, the patients whose results were unknown were discarded and the patients were grouped into good (1 and 2), moderate (3), and bad (4 and 5) outcome of surgery.

68 (78%) had a good surgical outcome.

7 (8%) had a moderately good outcome.

13 (15%) had bad results of surgery.

The only difference found at this follow-up was the rise in the number of patients with good results compared with the number of patients who were thus rated at the previous follow-up. This could indicate that either the extra case-finding effort brought in more cases with good outcome, or else the tendency for good results to fall off with time has halted, at least temporarily. To decide between these two alternatives it is necessary to examine the distribution of patients contacted at three years but not at the end of two and a half years and compare it with those contacted both at two and a half years and three years. Table 61 shows the findings in the two treatment groups.

In the surgical group, when the distribution of patients in the three categories of outcome was compared in the patients who were found at both two and a half years and three years and those who were found at three years but not at two and a half years, no significant differences emerged, $\chi^2 = 1.086$ (Yates correction applied). This supports that first hypothesis,

that a halt at this stage of the follow-up has occurred in the tendency for good results to fall off with time.

When the physical outcome of surgery was considered in terms of sex, site of ulcer, and indications for operation (Tables 60 and 62) it was observed that the findings at two and a half years still held good three years after the initial contact.

- (1) Women do less well after surgery than the men ($\chi^2 = 5.667, p < .02$).
- (2) Operative outcome does not depend on site of ulcer.
- (3) More bad results were found in the patients who were operated on for pain (19.6 per cent) than in those where complications were present (9.7 per cent) but the difference between the proportions of bad results in each group did not reach significance ($\chi^2 = 2.298$).

Physical outcome in the medical group (Table 63)

Seventy patients who have been contacted are considered in this group, and their symptoms at contact VI are compared with their symptoms at initial interview.

When the group was rated the following figures were obtained :-

1. No symptoms now; 20; 29%.
2. Symptoms improved 18; 26%.
3. No change in symptoms 21; 30%.
4. Symptoms worse; 10; 14%.
5. Readmitted to hospital; 1; 1%.

Thus, fifty-five per cent have improved, thirty per cent are unchanged and fifteen per cent are worse. Fewer patients at this follow-up have improved when compared with six months previously, when sixty-three per cent were considered to have improved.

Perusal of Table 61 where the patients contacted at both two and a half years and three years are compared with those found at three years but not at two and a half years, reveals that this last group contributes fewer patients with good results (2 patients) than unchanged (4 patients), and worse (4 patients). Unlike the surgical group, the extra effort in case finding has contributed towards the difference observed in the medical group in the last six months of the follow-up.

Psychiatric outcome in the treatment groups (Table 64)

Thirty-four (twenty-one per cent) patients have had no psychiatric symptoms demonstrated at any time, slightly fewer than at contact V (twenty-six per cent), and the group comprises nineteen per cent of the medical patients and twenty-four per cent of the surgical patients. The two treatment groups were compared for initial psychiatric symptomatology. A two by two table was constructed comparing those patients without psychiatric symptoms initially with the others, $\chi^2 = 0.466$. Thus at outset there was no difference in this respect between the groups.

The group with psychiatric symptoms was rated as before, and the following figures obtained :-

1. Symptoms gone; 12; 8%.
2. Symptoms better; 34; 20%.
3. Symptoms unchanged; 31; 20%.
4. Symptoms worse; 34; 21%.
5. New symptoms; 16; 10%.

Thus, twenty-eight per cent are improved, twenty per cent are unchanged, and thirty-one per cent are worse, and of this last group ten per cent have developed symptoms during the course of the follow-up.

Of the surgical patients twenty-five per cent are improved, eighteen per cent are unchanged, and thirty-two per cent are worse, and the corresponding figures for the medical group are thirty per cent, twenty-one per cent and thirty per cent.

Ten (eleven per cent) of the surgical group have developed psychiatric symptoms during the course of follow-up and six (nine per cent) of the medical patients. When these patients in the two treatment groups were compared with the others no significant difference emerged ($\chi^2 = 0.133$), so that no more surgical than medical patients in this series develop new psychiatric symptoms during the follow-up.

Observations on the parallel follow-up of physical and psychiatric progress in the treatment groups over three years

Figures 22 and 23 show graphically the physical and psychiatric outcomes in the treatment groups, and these were completed to mark the progress of the patients over the three years of the follow-up.

Perusal of the graphs reveals the impossibility of judging the outcome of treatment in peptic ulcer by means of a single observation at any given point in time. A continuous and fairly lengthy follow-up is necessary for an assessment of the results of treatment to be made with any degree of accuracy.

The differing progress of surgically treated and medically treated patients over the length of the follow-up can be seen. Operative intervention has reduced considerably the fluctuations of this chronic relapsing disease, and though the outcome of surgery is not constant over the three years, the observed changes do not appear to fluctuate so wildly as in the medical group.

At the end of three years, it can be said that the surgical group behaves more predictably than the medical group in respect of both physical

and psychiatric outcome. The observation that in the surgical patients the fall off in good physical results would appear to be halted, and that this coincides with the levelling off of the curve for rise in bad psychiatric results, suggests that a relationship exists between psychiatric and physical outcomes of surgery.

In the medical patients the similar shape of the curves for improvement in physical symptoms and improvement in psychiatric symptoms can be seen throughout the follow-up, and this suggests that a relationship exists, at least in this proportion of medically treated patients, between psychiatric and physical outcome.

FURTHER OBSERVATIONS AT THE END OF THREE YEARS ON PHYSICAL AND PSYCHIATRIC OUTCOME IN THE INDIVIDUAL PATIENTS

The graphs which had been drawn for each patient depicting the physical and psychiatric outcomes as rated on the five point scale at each six-monthly interval over two and a half years were completed. As before, each graph was then considered as a whole for the duration of the follow-up and each patient was allotted an overall grade for psychiatric and physical outcomes. This grade thus represented his progress over three years, and patients were given the grades, A,B,C,P,D,E under the same criteria as before Table 65. A was regarded as the best, and E the worst outcome of treatment, with the ordering of the intermediate grades as appears above. Grade I comprised those patients whose follow-up was "incomplete".

It was considered in this section that no new information had been furnished by the third year follow-up if :- a) the same grade was allotted to the patient at three years as had already been given at the end of two and a half years. In practice, this meant that the third year result differed by not more than one point on the rating scale from the previous result except in the erratic D or E type cases which at three years

were frequently still wildly swinging from one extreme to another: or
b) someone previously rated 1 at each six-monthly contact up to the end of two and a half years had been rated 2 on this follow-up. Under our definition this would have changed his overall grading from A to B had the third year result been available. This gain of information was regarded as negligible.

Surgical results were considered first, and then the results in the group of patients treated medically.

Patients treated surgically: 1 Physical grades

Physical grades in patients with initial psychiatric symptoms (Reds)

Patients who would have been allotted to the same grade on the results over three years as on the results over two and a half years were considered first. There were thirty-three of these. In nineteen the final (third year result) was the same as the last but one. Of the other fourteen, nine showed a difference of only one point, and five of more than one point. These five were all grade P,D, or E and showed a consistently erratic pattern.

Five patients were missing at the third year follow-up (patients numbered 115,149,168,205,182), and under our previous definition twelve patients had incomplete graphs.

Knowledge of the third year follow-up would have changed the grades in thirteen cases, but of these, three would merely have been marked B instead of A, an unimportant change. A more serious change affects four grade C's. On the third year follow-up their condition has deteriorated and it now appears that they should have been graded as D, but the wavelength of their oscillations was very long - about two and a half years.

There is one grade B who would have been P if the third year follow-up had been available (patient number 126).

The remaining five are all P's who showed a remarkable improvement (up to 1 or 2) by the third year follow-up. In four of these, it is impossible to say whether the improvement will be maintained (patients numbered 48,50,96,202) in which case a need for a new category, M, a bad patch in the middle, might be envisaged, or whether they will swing down again and be classified D. Change of grading from P to D is an unimportant change, both gradings being regarded as unsatisfactory results of surgery, but if improvement is maintained the results as far as two and a half years would be misleading.

The last case (201) underwent a second definitive operation just before the two and a half year follow-up and at that time was presumably suffering after-effects from which he has now recovered. He is thus a rather special case.

Physical grades in patients who had no psychiatric symptoms initially (Greens)

As before, patients whose grades would not have been changed are considered first. There were sixteen of these. In this group fourteen have the same grades on this occasion as they had at the two and a half year follow-up. Two grade B's move one point but remain in 1 or 2.

Four have been labelled incomplete (I), and two patients have no third year follow-up.

In two patients the grades would have been changed. One patient who was rated 1 or 2 for two years thereafter fell to 3 and was, therefore, graded P (patient number 23). He is again rated as 2 at this occasion and should probably be a marginal B.

Patient number 72 did very badly until the two and a half year follow-up when he was rated 2. He was graded D but has maintained the dramatic improvement and is still rated 2. He should, therefore, have been graded C.

Physical grades in patients who developed psychiatric symptoms during the course of the follow-up (Green and Yellows).

All ten in this category would have had the same overall grade using the third year follow-up as well as the rest. Five have been rated exactly the same on third year and two and a half year follow-ups, and five have moved one point.

Patients treated surgically: II Psychiatric grades

Psychiatric grades in patients who had psychiatric symptoms initially (Reds)

It has been observed that thirty-three patients did not change their physical grading.

Of these, thirty-two have not changed their psychiatric grade. Twenty-eight show no shift, and four have a shift of one point.

The other case (patient number 35) was graded P on psychiatric symptoms after being in 2 for two years and then falling to 4. On the third year follow-up she is back in 2, so she could have been just a temporary lapse from B.

In thirteen cases the physical grading would have been allotted differently if knowledge of the third year result had been available. The psychiatric grading was then considered in these patients.

The three patients who move from A to B retain the same psychiatric grade.

Of the four errant C's, all retain the psychiatric grade (in two cases D and in the other two cases B).

The patient graded B who would have been a P using the third year follow-up fell from 2 to 3 on psychiatric results also, and so would just qualify to be relabelled a P psychiatrically as well as physically.

Of the other five P's, four retain the same psychiatric grade. One who was labelled D psychiatrically might just qualify to be relabelled C on the evidence of the third year follow-up.

In the surgical reds, therefore, forty-three patients in all retain their psychiatric grade.

Psychiatric grades in patients who had no psychiatric symptoms initially (Greens)

One patient in the third year follow-up (patient number 162) developed new psychiatric symptoms in the last six months. With this exception, this group is still rated 1.

Psychiatric grades in patients who developed psychiatric symptoms during the two and a half year follow-up (Green and yellows)

In the last follow-up five patients move one point only.

Two of the zig zags move two points.

Two further patients (numbers 34 and 151) had new symptoms at the third year follow-up so 'change' was not measured.

Patients treated surgically: III Anxiety Scores

Under our definition, in this group of patients real information has been gained by continuing the follow-up for three years in ten patients out of forty-six.

Of these ten, one was excluded since the timing of his second operation seems to be the relevant factor in the change of grading. The nine who do yield new information are: five who appeared to do well and got worse, four who were doing badly and improved.

Physical and psychiatric grades and anxiety scores in these nine were tabulated (Table 66) The mean anxiety score for these nine is 9.33. The mean anxiety score for the other thirty-six "complete" up to three years is 6.92. Therefore, $t_{43} = 1.707$, $0.05 < p < 0.10$. The suggestion is, though

the results do not attain five per cent significance, that patients who have not stabilised at three years score higher on anxiety than do the others. Of these nine patients, the five who got worse scored 10, 17, 3, 10, 8 on anxiety, and the four who got better scored 8, 14, 5, 9.

Summary of findings at three years in the surgical patients

1. Patients with no psychiatric symptoms initially, or who developed psychiatric symptoms during the follow-up - no further information has been gained by extending the follow-up to three years. There are two exceptions to this statement out of twenty-eight patients.
2. The group of patients with psychiatric symptoms initially is less predictable in outcome. Extension of the follow-up for another six months has yielded little new information in thirty-six patients out of forty-six. But in ten patients the physical outcome has still not stabilised. This emphasises the danger of rash predictions of outcome in patients with psychiatric symptoms initially - about one fifth are still behaving unpredictably, though about four fifths seem to have settled down by two and a half years.
3. There is a suggestion that the unpredictable one fifth have a slightly higher mean anxiety score than the other four-fifths ($t_{43} = 1.707, 0.05 < p < 0.10$).
4. Psychiatric findings are more stable than physical findings - forty-three patients out of forty-six give no new information at three years.

Patients treated medically: 1 Physical grades

Patients with no psychiatric symptoms initially (Greens)

In this group fifteen patients had the same overall grading as before.

Of these, thirteen had the same rating at three years as they had six months previously. The other two each moved one point only (patients numbered 129 and 76).

Six would have been graded differently had the three year follow-up been available. However, of these, three had had operations which had produced a dramatic improvement between the previous follow-up and the present follow-up (patients 83,98,139).

Of the other three, one was a C who had slipped down to 3 again, and thus should really have had an overall grading of D (patient number 13) and the other two (patients 53 and 6) were a P and a D who showed improvement.

The other results in this group of patients were one third year follow-up not available (patient 165), and five labelled incomplete (54,61,64,91,162).

Patients with psychiatric symptoms initially (Reds)

In this group twenty-five patients had grades which were unaffected and the third year result was the same as the previous one. A further ten patients showed a shift of only one point between the third year and previous six months, so that they too showed no change of grade. (32,2,12,68,145,82,103,113,114).

There were two deaths (patients number 97 and 116).

Five patients had no third year follow-up available (101,155,199,118,172) and the incomplete group comprised thirteen.

Fourteen patients would have been graded differently had the third year result been available. Thus fourteen out of forty-eight would have changed grades, a slightly higher proportion than was found in the surgical group. Of these, six were relapsed B's or C's (patients 37,77,81,99,104,109), and five were D's who had shown improvement by the previous follow-up, and this improvement was maintained (44,56,179,125,157). The remaining three

patients who changed, (patients numbered 93,132,186) were suddenly improved P's. One of these changes (patient 132) was attributable to operation.

Patients treated medically: II Psychiatric grades

Patients with psychiatric symptoms initially (Reds)

The thirty-five patients whose physical grades were the same were considered first. Of these thirty-one have the same psychiatric grade. The other four are a relapsed B and C (patients 60 and 102) and two improved D's (patients 32 and 195).

The fourteen patients who would have had a different physical grade were then considered. Twelve would have had the same psychiatric grade.

Of the two who showed psychiatric changes as well as physical changes, one(patient 132) had had an operation while the other (patient 125) had maintained an improvement which had in fact been visible at the previous follow-up.

Patients treated medically: III Anxiety score (Table 67)

Mean anxiety scores for those patients who change grades = 9.071

Mean anxiety scores for those patients who do not change grades = 8.200.

$t_{47} = 0.618$ which does not show any significant difference.

Thus there was no demonstrable difference in anxiety scores in this group of patients when the patients who changed grades were compared with those who did not change grades.

Summary of findings at three years in the medical patients

1. Patients without psychiatric symptoms initially. No further information has been gained by extending the follow-up in fifteen out of twenty-one patients. Of the remaining six,

three have been operated on, which removed them from this group. In a very small proportion, therefore, three out of eighteen, real information had been gained. This group of patients treated medically has been less predictable than the same group treated surgically.

2. Patients with psychiatric symptoms initially. Further information has been gained in a slightly higher proportion of this group of patients treated medically than in the similar group treated surgically. This would seem to be a reflection of the relapsing nature of chronic peptic ulcer disease. Unlike the surgical patients the unpredictable group does not show higher anxiety than the predictable group.
3. Psychiatric findings are much more stable than physical findings. Forty-three out of forty-nine add no new information at three years.

Comparison between the work record of the patients in the two treatment groups
Tables 68 and 69

No new information was gained and findings were exactly as obtained at the end of two and a half years.

Activity rating of the housewives - treatment groups compared Table 70

No new findings were made.

Drinking habits of the patients (Tables 71 and 72)

As has been observed before, the women recorded practically no change.

Four medically treated males and seven treated surgically reported that they were drinking more.

Effect of alcohol - treatment groups compared (Tables 73 and 74)

In the medical group nobody reported any change in the effect of alcohol. Twenty-three per cent of men treated surgically still considered they got drunk on less alcohol than before their operation. This figure has remained fairly constant over the length of time of follow-up.

Frequent drinkers

An attempt was made to assess the progress in the group of patients who, at the initial interview, had reported that they drank an appreciable amount of alcohol every day. There were twenty of these, all being males of whom thirteen had undergone operation.

Of these thirteen, five were drinking more heavily but in only one was alcohol a problem. This was the patient noted six months previously as having made several suicidal attempts, lost his job, and required mental hospital admission. He had been diagnosed alcoholic pre-operatively. The downward trend in this patient's general behaviour had continued in the last six months of the survey.

In the medical group seven, all males, drank every day. One man was in "trouble" during the three years of the survey. In the last six months his drinking had increased. He blamed marital problems for this, and two weeks before his last interview had attempted to commit suicide by taking thirty phenobarbitone tablets. Alcohol was considered to be a definite factor in his suicidal attempt. The initial psychiatric assessment in this man had been "anxiety symptoms in a psychopathic personality".

A further patient in this group, though he drank every day, became addicted to benzedrine and this latter phenomenon, rather than his drinking habits, necessitated psychiatric hospital admission during the survey.

Thus one medically treated and one surgically treated patient had attempted suicide during the three years of the follow-up, and in both

cases alcohol was claimed to be an important precipitating factor.

Heavy drinking, therefore, has not been demonstrated to be a particular problem after surgery in this group of patients.

Smoking habits (Tables 75 and 76)

Perusal of these tables shows that no change has taken place in the last six months. Smoking habits have, therefore, tended not to alter during the span of the survey, and there is no difference between the treatment groups.

CHAPTER 7

THE DISCUSSION OF THE RESULTS

DISCUSSION OF RESULTS

In the introductory chapter to this thesis the concept of peptic ulcer disease which underlay the present approach to the problem of its treatment was outlined, and the frequent lack of satisfactory evidence available in the literature about the role of psychological factors in treatment outcome was noted. While a good deal of factual information concerning their importance had been gathered, a study of the literature revealed that speculation and the anecdotal approach were still extremely prevalent in this aspect of peptic ulcer disease. Furthermore, the impression gained from the background literature was that psychiatrists and gastroenterologists, though they both stressed the value to be placed on the role of psychological factors in prognosis, had diverged in their researches. Knowledge gained by the psychiatrist did not seem to be put to good use by the gastroenterologist and the converse was also true. An example of this is the increasing psychiatric interest in the results of surgical treatment of peptic ulcer. Psychiatrists have examined their patients after operation without considering the various physical factors which have been demonstrated by the gastroenterologists to be of relevance, for instance, the fluctuation in physical outcome to be expected with length of time after operation. Similarly the gastroenterologists have discussed the psychiatric outcome after surgery and have analysed the personalities of those patients who have to be judged as failures in terms which are psychiatrically meaningless.

This study, therefore, was designed to investigate the problem of the role of psychological factors in prognosis in a very simple way:-

- 1) Delineation of social variables and the psychiatric state in this particular group of patients with chronic peptic ulcer before the initiation of treatment.

- 2) Assessment of the physical and the psychiatric state of the patients at six-monthly follow-up reviews.
- 3) Investigation of the relationship between psychological and physical factors in the outcome of treatment.
- 4) Assessment of the value of psychological factors in the prediction of outcome.

During the course of the study other results emerged which, while germane to the problem, did not bear quite so directly on the main theme of the investigation.

Discussion of the results will, therefore, be undertaken under the following headings:-

- 1) Assessment of the group before the beginning of treatment.
- 2) The relationship between psychological and physical factors in the outcome of treatment.
- 3) The value of psychological factors in the prediction of outcome.
- 4) Other results which have emerged from the study, in particular, the relevance of the psychological assessment in the delineation of those patients in whom a long continuous follow-up after treatment is unnecessary. The role of formal psychiatric treatment in patients with peptic ulcer is discussed. Finally, the findings from this study as a whole are examined against the available knowledge of the role of psychological factors in treatment outcome in other chronic diseases.
- 5) Suggestions for future research which have arisen in consequence of the results of the present study.

Assessment of the Group before the beginning of treatment

Mention has already been made of the specialist nature of the Unit in which the study had its setting, and the consequent worry that patients with peptic ulcer treated by this Unit might differ from other hospital populations. Results from the study, therefore, could be true for these particular patients but would not be applicable in any more general sense.

Review of the literature has emphasised that peptic ulcer patients referred to hospitals are not representative of peptic ulcer in general but rather of those characteristics of the disease which cause referral of the patients to hospital, for example, those inherent in the disease itself such as complications and the effects of ageing, and those, mainly social and occupational, which govern the admission of the patients to hospital. The present group, in which the patients are predominantly males with duodenal ulcers and which contains relatively more women with gastric ulcers, is very similar to other groups of patients with peptic ulcer treated in hospitals. In comparisons, attention must be paid to the fact that change in incidence of peptic ulcer had taken place over time and that the incidence varies from one part of the country to another. Our ratios of DU:GU for men and women are very similar to figures obtained in recent years from Glasgow and the South-West of Scotland, and are rather alike the same ratios obtained from studies in York and London. It can be deduced, therefore, that the present ulcer population under review does not differ significantly in its physical characteristics from other hospital populations.

Kellock (1951) showed that in respect of many social variables ulcer patients did not differ from other hospital in-patients. Social variables examined in this study have demonstrated close similarity between the diagnostic groups of peptic ulcer but that, where differences do occur, they

occur between patients with gastric ulcer and the others. This finding occurs in the setting of clinical evidence that on medical grounds gastric ulcers differ from duodenal ulcers and the group where duodenal and gastric ulcer co-exists. In the consideration, therefore, of both physical and psychological factors in outcome it is possible to combine the two latter groups and compare them with the group of patients with gastric ulcers.

In the discussion of the results of the initial psychological assessment it is possible to begin with the premiss that this ulcer population is similar in physical characteristics to other ulcer populations, and, therefore, it should be possible to compare psychological findings in this study with those of other studies. However, in this attempt the problem is the all pervading one in psychiatric research; vagueness in nomenclature. It is uncertain whether the investigators are even describing the same phenomenon. For instance, previous studies of the incidence of psychoneurosis in hospital peptic ulcer patients have varied in their findings between nought per cent and one hundred per cent of the group. For this reason it is not possible to compare our figure of sixty-nine per cent for the incidence of psychiatric illness in this group with the incidence figures obtained from other groups. Certain conclusions have, however, been reached by several investigators of the nature, if not about the quantity, of the psychiatric disability to be expected in a hospital population of patients with peptic ulcer. Our findings in this respect can be considered with the findings of other studies. In this, as in other groups of patients with peptic ulcers, psychoneurosis is the main psychiatric disability present. Anxiety and depression were the diagnoses most frequently made in this group of chronic peptic ulcer patients.

Gastric ulcer patients have more presenting psychiatric illness than duodenal ulcer patients. This finding may merely reflect the fact that

neurotic illness is higher in women than in men. Other investigators have also commented that neurotic illness is higher in women with ulcers; Gainsborough and Slater (1946) - "women have a higher incidence of constitutional disability"; Kapp, Rosenbaum and Romano - "women are most likely to make a poor adjustment to their environment." Our finding that significantly more women than men have been diagnosed "immature" would be in keeping with their observations. But it has been demonstrated in this study that, though more women than men have psychiatric symptoms (seventy-eight per cent compared with sixty-three per cent respectively) the difference does not reach significance. It suggests, therefore, that though sex differences contribute to the difference noted between duodenal and gastric ulcers, this difference cannot wholly be explained on these grounds.

A search of the literature for figures with which to compare our finding of more psychiatric illness in patients with gastric ulcer than in patients with duodenal ulcer proved in the main unrewarding. Studies comparing duodenal and gastric ulcer patients for psychiatric symptoms are few; Hamilton (1950) found that more duodenal ulcer patients than gastric ulcer patients had anxiety neurosis; Wretmark (1953) concluded that no specific personality existed in gastric ulcers but did in duodenal ulcers; Helsing, who considered the sexes separately, suggested that fifteen per cent of cases of duodenal ulceration in both males and females were psychogenic, and that in gastric ulcers in one female in three and one male in eleven, the origin of the ulcer was psychogenic. It is obvious that Hamilton's interest lay primarily in the estimation of the occurrence of anxiety in his patients. Findings in the present investigation would tend to agree with his conclusion that more duodenal than gastric ulcer patients had anxiety neurosis. The suggestion has been made, though the figures did not show a significant difference, that more duodenal ulcer patients presented with anxiety and more gastric ulcer patients with depression.

Wretmark's claim that a specific personality could be demonstrated to occur in patients with duodenal ulcers would receive little support from modern investigators and in our study no one specific personality was found in either type of ulcer patient. Helsing's investigation of the question of the psychogenic origin of peptic ulcer is not precisely comparable with findings in the present study.

Only in very general terms, therefore, can it be said that the results in this study of the nature of the psychiatric illness present are roughly comparable with the results of previous studies. The impossibility of the comparison of incidence figures has already been discussed. From the point of view of the outcome of treatment, wherein lies the main theme of this study, it can be said that an appreciable proportion of patients (sixty-nine per cent) have psychiatric symptoms on the initial assessment before treatment and that this figure receives a significantly higher contribution from patients with gastric ulcers than from patients with duodenal ulcers.

The Relationship between Psychological and Physical Factors in the Outcome of Treatment

It is worthy of note that treatment methods in this group of patients have not differed appreciably from those employed with other patients hospitalised for peptic ulcer. Indications for operation in this group are identical with those most frequently quoted. Daintree Johnson suggested that, of patients referred to teaching hospitals in England and Wales, approximately fifty per cent would come to operation and our figures for this group are thus very similar.

The design of the present study owes much to the work of Visick and Pulvertaft in York. This was quite deliberate as these investigators have issued figures on what is possibly the most extensive and complete follow-up of physical results of surgery for peptic ulcer. All their patients had had gastrectomies but in their unit this was the operation of choice, and gastroenterostomy was restricted to the very few cases who were judged physically to be extremely poor surgical risks. Their short-term results (that is, up to end of three years) are of relevance to the present study. They noted that their symptom-free group increased with length of time; forty-seven per cent at six months rising to sixty-six per cent at three years. A sex difference in outcome was observed, sixty-six per cent of the men and only thirty-seven per cent of the women being symptom free. Their failure rate (groups 4 and 5) was 4.3 per cent at six months, rising to six per cent at the end of three years. Our physical findings, on the contrary, have suggested a drop in the symptom-free group over three years. The failure rate in our patients, however, follows the same pattern as the York study though it is somewhat higher.

Visick, though primarily concerned with physical results, suggested that psychological factors did have a significant role in outcome. He examined those patients who had been rated as failures on at least one occasion of a series of six-monthly reviews over three and a half years, and noted that more failures occurred in the group of patients operated on in the first two and a half years of the study than in those operated on in the last year. During the first period he had operated on patients with a pronounced neurotic overlay to find out if it were possible to produce good results in these patients, but the experiment was not successful and he judged that, though excellent results could be produced in some of these patients, too large a

legacy of failure had been left. During the last year of the review his selection of patients was much more rigorous in that he excluded those patients in whom he considered a neurosis to be present.

This study has been conceived to explore further these last facts. The patients have been assessed at six-monthly intervals over three years both on psychiatric and physical outcome. In addition, a group of medical patients under the same conditions of length of history, referral to hospital and follow-up assessments has been included in the study. The detailed assessment of the patients in the surgical group at each six-monthly review over three years has demonstrated fluctuations in outcome where a fall in the proportion of patients with a good physical outcome is accompanied by a rise in the proportion of patients whose psychiatric outcome is worse than before treatment. In the medical patients the overall picture of the physical fluctuations of a chronic relapsing disease has emerged. In addition, it was possible to show that a similar fluctuating pattern appears when the progress of the psychiatric symptoms in this group is considered separately. The suggestion that physical and psychiatric results are related in both treatment groups is thus very plausible. Changes and fluctuations common to both physical and psychiatric results in the surgical group have been demonstrated but, taking the medical patients as controls, it is obvious that surgical intervention has disrupted the pattern of the disease. Fluctuation in the results of surgical outcome vary much less wildly than do those in the medical group. Also, more patients after surgery have altered in the direction both of improvement and of deterioration in both sets of symptoms. In the only study which could be roughly comparable, Ely and Johnson from Seattle (1965) reported on fifteen patients with duodenal ulcer who had had an operation and fifteen patients who had been treated medically whom they followed up at

intervals over three years. M.M.P.I. data for these patients showed a greater change in the post-gastrectomy group ~~both towards more psycho-~~ ^{when they were compared with the medical group.} ~~pathology and in the direction towards less psychopathology than was found~~ ^{After surgery more patients improved than did the medical patients but on the other hand a greater number of surgical patients deteriorated psychiatrically than did those in the medical group. in the comparable medical group.}

The finding in the present study that approximately thirty per cent of patients with psychiatric symptoms improve after surgery and that six per cent of the total group recovers completely would suggest that Visick's removal of all such patients from his operating list is much too sweeping.

But information based on data from the treatment groups is limited in its usefulness, and unless fluctuations in physical and psychiatric state can be shown to coincide in the same patients it cannot be considered that a definite relationship between physical and psychiatric symptoms has been established. For this reason, in this study attention was turned to the individual. In a later article concerned with long-term results of operation for peptic ulcer, Pulvertaft in 1952 had also examined physical outcome in this way. He concluded that the individual's reaction to gastrectomy fluctuated and further suggested that, especially with respect to the dumping syndrome, psychoneurotic factors were instrumental in producing the observed fluctuations. Pulvertaft, however, did not supply any concrete data to account for this general comment and was content to leave this as a clinical impression only. In this study his findings have been extended and the individual's outcome in respect of physical and psychiatric symptoms examined. Not only do physical results of operation vary in a large proportion of cases but similar fluctuations occur in psychiatric symptoms also. It has been demonstrated that a relationship exists in the individual between physical and psychiatric outcomes, but to claim a dependence of the one on the other goes beyond the available data. Good physical outcome goes with good

psychiatric outcome and the converse is also true. Examination of the individuals has thus shown a high correlation of physical and psychiatric outcomes.

Browning and Houseworth (1951) and Badal, Driscoll and Maultsby (1956) concluded that relief of ulcer symptoms, especially by surgical means, resulted in the appearance of new psychiatric symptoms. It has not been shown in this present study that a significantly higher proportion of patients in the surgical group has developed psychiatric symptoms for the first time when compared with patients in the medical group. Furthermore, relief of ulcer symptoms has been correlated highly with relief of psychiatric symptoms.

Value of psychological factors in the prediction of outcome

It has already been noted in the relevant background literature that several authors have been interested in this problem; contributions have come mainly from America and the majority have been confined to examination of the male patient with duodenal ulceration. Weiner in 1955 suggested, using a retrospective assessment by means of the M.M.P.I. of twenty patients with successful results of operation and twenty who were rated as failures, that the more neurotic patients were more likely to be found in the latter group. Thoroughman and his co-workers from Georgia in a series of articles from 1960 onwards concluded that indications for operation were of predictive value, patients being operated on for relief of pain doing significantly less well than the group of patients in whom complications of ulcer disease were present. They then concentrated on the former group and constructed deprivation scales, based on patients' early memories, which they claimed were of predictive value, the more deprived patients having the worse prognosis.

In this study, the presence of psychiatric symptoms judged clinically before operation has proved to be of predictive value, patients without psychiatric symptoms doing significantly better. The anxiety score obtained from the answers to a questionnaire given to the patients before treatment correlated significantly with the clinical psychiatric assessment, those patients with high scores being correlated highly with those patients diagnosed as having psychiatric symptoms. Patients with high anxiety scores did significantly worse after surgical treatment than patients with lower scores. In respect of indications for operation, such a convincing demonstration as Thoroughman's of poor results in the patients without complications has not been shown, though our findings do suggest that patients in whom complications are present have a better outcome after surgery. But it has appeared that the pre-treatment psychiatric assessment of the patients either by clinical diagnosis or using the anxiety score has been much more successful in the prediction of surgical success than the indications for operation. Also this has been true not only of males with duodenal ulcer, but holds for both males and females, duodenal ulcer and gastric ulcer.

Similar findings have been obtained in the medical group, though the results have not been so dramatic as in the surgical group. Thus pre-treatment psychiatric assessment and anxiety scores have also proved of predictive value in the outcome of medical treatment. This suggests that both operation and medical treatment have in essentials the same effect on peptic ulcer disease. There is nothing peculiar to the effect of operation, merely intensification of similar effects that can be noted after medical treatment.

Unfortunately it was not possible to single out clinically a particular psychiatric diagnostic group which was associated with a bad prognosis, though

the suggestion has been made that the immature personality was over-represented in the group with poor results. Three years later about one fifth of the patients still have very erratic results after surgery and the suggestion emerges that this group has even higher anxiety scores than the others. Patients with high anxiety scores are correlated highly with those patients with psychiatric symptoms, and this last finding suggests that the more severely ill psychiatric patients comprise that proportion of the ulcer population who will have the worst physical outcome of treatment.

Other Relevant Results of the Study

1. Pattern of Future Follow-Up Studies

It has been observed that not only do the group of patients without psychiatric symptoms do better than those with psychiatric symptoms, but they also show a much more stable course after treatment. By six months after treatment, and this is especially true of operation, the pattern has been set and on further follow-up contacts they have altered very little. From the point of view of saving time, both for the patient and the investigator, it is obviously unnecessary to follow up this group over a more prolonged period. Also using the anxiety score as a rating of severity of psychiatric disturbance, it can be suggested that those patients with psychiatric symptoms whose anxiety scores are not too high will be the group who settle after surgery, and thus also do not require a prolonged follow-up. Attention could, therefore, be directed to the group who have the highest anxiety scores, as it is in this group of patients that possible future trouble, both physical and psychiatric, will be concentrated. It is realised that this last statement may be open to challenge, as our results

did not demonstrate this quite so conclusively as it has been stated here, but the available evidence was certainly very suggestive.

This was not shown to be true of medical patients.

2. Progress of the Group who received formal psychiatric treatment

The finding that patients with high anxiety scores who had received formal psychiatric treatment during the follow-up had done better, both physically and psychiatrically, than patients with similar anxiety scores who had not received psychiatric treatment, was entirely unexpected. Several authors have suggested that psychiatric treatment after surgery might be of importance at least in some patients; to quote two examples, Pulvertaft from his surgical follow-up, and Badal Driscoll and Maultsby from their evaluation of psychological factors in the outcome of surgery.

The group who were referred by the clinicians of the Unit for formal psychiatric treatment after physical treatment had been undertaken were originally looked upon as a possible source of contamination of the results, and the question of excluding them from the survey was first considered and then shelved for the time being. It was noted, however, that although the results had demonstrated that patients with high anxiety scores tended to do badly, some patients were notable exceptions to this. Further examination revealed that the patients who were in a large measure contributing to the discrepant results were those who had been treated psychiatrically. While it is realised that the group thus treated was a highly selected one, and in fact the study was not designed to investigate the results of psychiatric treatment in a group of ulcer patients, this finding is put forward as being extremely suggestive and as an avenue for future research planned to investigate this fact more fully. If it were so confirmed, it suggests that

psychiatrically disturbed patients in whom physical circumstances make operation either desirable or imperative, could have this outcome improved by psychiatric treatment, and not, as somewhat arbitrarily decreed by Visick, be denied a form of treatment available to the more stable patient.

The psychiatric treatment which the patients received was in the main supportive psychotherapy on an out-patient basis, with or without anti-depressant or tranquillising drugs, depending on the psychiatric diagnosis. The social aspect was extremely important in treatment. The majority of the patients had personality disorders with resulting family, financial and interpersonal problems, for which the help of the social worker was freely available and invaluable. Only two patients required in-patient psychiatric treatment during the course of the follow-up; one after surgery and another who was in the medical group.

3. Non Ulcer Dyspeptics

Two hundred and five patients had initially been referred by the clinicians of the Gastro-Intestinal Unit for inclusion in the peptic ulcer survey. In the relatively high number of twenty-seven cases the clinical diagnosis, as made by highly experienced clinicians, was not substantiated on further investigation. This finding engenders care in the comparison of findings in this study with any others in whom the clinical diagnosis has not been so confirmed. Sainsbury's group of peptic ulcer patients, in his study of neuroticism in medical out-patients, is an example of this.

Also the group of non-ulcer dyspeptics have significantly more psychiatric disturbance ($p < .001$) than the group of patients with peptic ulcer. Even when those patients without organic disease are excluded, a group of patients remain with organic disease and significantly more psychiatric symptomatology than

appears in the peptic ulcer group. It is possible to speculate that patients referred to the Gastro-Intestinal Clinic might be a fruitful source for research into psychiatric disturbance in the general hospital.

Though really outwith the scope of the present study, this last suggestion that the ulcer patient is not alone in having, and may possibly suffer less, psychiatric disturbance than other patients referred to the Gastro-Intestinal Clinic, brings the discussion of results to the point that it must be emphasised that no claim is made that our findings of the high incidence of psychiatric disturbance and the relationship of psychological factors and treatment outcome in peptic ulcer are specific to this disease.

On the contrary, the review of the background literature has shown that other investigators have found that a high proportion of patients referred to the general hospital have psychiatric disturbance; for example, Culpan, Davis and Oppenheim noted that more patients among those attending medical clinics than among those attending surgical clinics suffered in this way. The importance of psychological factors in the course and outcome of treatment of rheumatoid arthritis has been demonstrated by Moos, and their influence on the outcome of open heart surgery by several investigators. Indeed Garner, in a comprehensive review of the effects of operation, stressed that the physical outcome of any operative procedure is dependent on the personality of the patient. The present findings in peptic ulcer are, therefore, in keeping with the current trends in research into other diseases, and further emphasises the growing recognition of the importance of the individual's reaction to a chronic disease in its progress in that individual, and in the outcome of treatment.

Indications for future research

After the design of the study had been indicated the hope was expressed that the results of this preliminary investigation would enable more precise hypotheses to be formulated.

Many of the findings in this study do indeed suggest hypotheses for testing in future research, and in the enumeration of the results, methods whereby this might be accomplished have on occasion been indicated. The following are suggested as worthy of exploration:-

1. Psychological Factors in the Outcome of Treatment

The primary aim of the present study was the identification of any psychological factors which were relevant to the outcome of treatment. It has been shown that psychiatric illness assessed on clinical grounds has been of value in the prediction of outcome. Though no single diagnostic group could be definitely associated with a bad prognosis it was possible to suggest that those patients diagnosed as immature were more likely to have a poor outcome of treatment. This last finding indicates that fuller investigation of this particular group of patients would be fruitful in the further delineation of the "poor risk" patient. The usefulness of anxiety as a predictive measure has been established and it was possible to narrow this down further by the suggestion that those patients judged more psychiatrically ill on higher scores of anxiety comprised that segment of the psychiatric population who would be associated with the worst prognosis. Further investigation into the severity of presenting psychiatric illness should, therefore, be of value. Also the tentative finding from this study that high aggression and good surgical outcome are related suggests that a measure of this could be usefully incorporated in any future investigations into the influence of psychological factors on treatment outcome.

2. The addition of psychiatric to physical treatment in peptic ulcer patients.

The completely fortuitous finding that psychiatric treatment appeared to improve the outcome of treatment in some of the patients is worthy of an investigation designed to examine this particular aspect. If this is confirmed, it opens up a practical method of dealing with a group of patients who have constituted a major problem to the gastro-enterologist, especially when the progress of the disease, for example, the presence of complications, makes surgery the treatment of choice.

3. Parental Deprivation in Peptic Ulcer Patients

The finding that significantly more patients with gastric ulcers suffered deprivation, especially paternal deprivation, than did the duodenal ulcer patients would require confirmation and examination in much greater detail. Thoroughman's later work suggested that maternal deprivation was predictive of poor surgical outcome in male duodenal ulcer patients, and Barry and Lindemann (1960) concluded that reactive depression was linked with separation from the parent of the opposite sex. Another finding in this present study was that gastric ulcer patients tended to present with depressive symptoms and duodenal ulcer patients with anxiety. With these suggestions as a basis it should be rewarding to examine parental deprivation in a group of peptic ulcer patients to find out if Thoroughman's conclusions from his work with male duodenal ulcer patients after surgery could be extended to all patients with peptic ulcer, either treated medically or surgically, and to see if the difference between gastric ulcer and duodenal ulcer patients in respect of parental deprivation was reflected in the outcome of treatment in these groups.

4. Extension of this type of study to other patients referred to general hospitals.

Reference has already been made to the fact that the results in this present study are probably not specific to peptic ulcer. It would be of value to apply techniques similar to those described here in the investigation of other patients referred to the general hospital. Suggestions of the relevance of the personality of the patient to the outcome of treatment have obviously very wide implications in the present day practice of general medicine and surgery.

CHAPTER 8

CONCLUSIONS

CONCLUSIONS

1. The ulcer population under review in this present study resembles other populations of peptic ulcer patients reported from general hospitals in Great Britian in respect of its physical characteristics, that is, it is predominantly a middle-aged and elderly population of patients with a long history of ulcer dyspepsia (mean length 12.4 years) and complications of the disease are present in an appreciable proportion of the group. The majority of the group are male patients with duodenal ulcers and there are relatively more women with gastric ulcers. The physical characteristics of this hospital group, therefore, in common with other hospital groups of patients with peptic ulcers, do not reflect the picture of peptic ulceration as it is present in the general population but rather those characteristics of the disease which necessitate hospital referral.
2. The ulcer population in respect of the social variables studied is a homogeneous one but where differences do occur, for example, in the examination of parental deprivation, the group of patients with gastric ulcers differ from those with duodenal ulcers and those where a duodenal ulcer and a gastric ulcer occur together.
3. It was possible to compare this particular group of patients with other patients referred to the same hospital for sex, age, civil state, social class and parental deprivation. The outstanding difference occurred in the sex ratio; the dominance of males in the ulcer population was not found in other patients referred to the same hospital. The suggestion emerged also that significantly more patients with peptic ulceration had suffered from parental deprivation than had the other patients. But in the other variables which were studied the patients with peptic ulcers tended to resemble their fellow patients.

4. Psychiatric morbidity in this group of patients with peptic ulcer was high. Sixty-nine per cent were judged on clinical grounds to be psychiatrically ill at the initial interview. Patients with gastric ulcer had a higher incidence of presenting psychiatric illness than did those with duodenal ulcer, but there were no demonstrable differences in the diagnostic categorisation of such psychiatric symptomatology between the ulcer subgroups. A measurement of anxiety present initially revealed that the group of patients with psychiatric diagnoses had a high mean anxiety score.
5. The necessity for a long and continuous follow-up after both surgical and medical treatment has been demonstrated in the proportion of the group who are psychiatrically disturbed. Possibly, since after three years, approximately one fifth of the surgically treated group are still behaving erratically in respect of outcome of treatment, three years is not a sufficiently long follow-up for assessment of results in this particular proportion of the group.
6. Psychiatric and physical outcomes of treatment are quite closely related, good psychiatric results being found in patients with good physical results and the converse is also true. This statement applies to both operative intervention and medical treatment. This relationship has been demonstrated to occur in detail, by means of the rating at each six-monthly review, and overall, by means of the grading of the patients which gave a composite picture of the outcome over the length of the follow-up. The relationship between physical and psychiatric outcome is a subtle one and a dependence of the one aspect upon the other has not been shown.
7. In the prediction of results of treatment the initial psychiatric clinical assessment and the anxiety score have been more successful than any of the other available measures. This applies to both medical and

surgical patients.

Personality factors such as "goer" and "non-goer" have not proved to be of predictive value. This applies to the particular methods used in this study in the attempt to quantify the clinical hunches and may be in part a reflection of the inadequacy of our methods.

The type of indication for operation has been shown to have a place in the prediction of results of surgery, more patients in whom complications were present pre-operatively having good operative results than patients whose indication for operation was pain. But the anxiety score has been more accurate than the indications for operation in the prediction of results.

8. In patients treated surgically, severity of psychiatric disturbance, as judged by the anxiety score, has been a factor in that group of patients (approximately one fifth) who have had a disappointing and erratic course after operation. This was not shown to be true for the medical patients.
9. Patients with high anxiety scores who had psychiatric treatment had a better outcome both psychiatrically and physically than did patients with high anxiety scores who did not have psychiatric treatment.

CHAPTER 9

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ACKNOWLEDGEMENTS

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CHAPTER 10

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